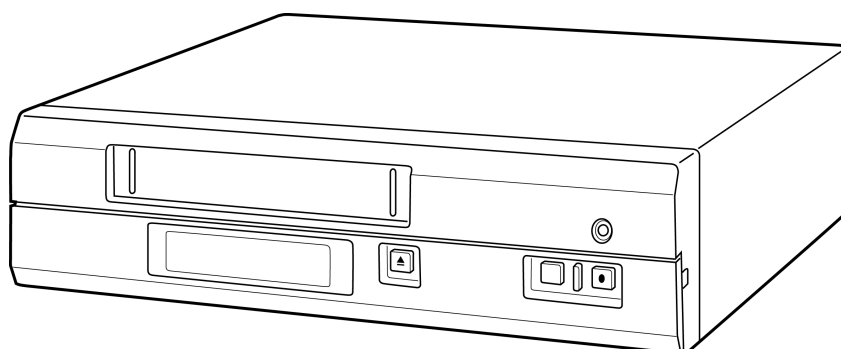


Service Manual

Super VHS ET **S** **VHS** VHS
PAL
625

Time Lapse Recorder

AG-TL750E/B



Panasonic

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Specifications

- **Recording system** Luminance: FM recording
Colour: down-converted direct recording
- **Signal system** PAL-type colour signal, CCIR monochrome signal, 625 lines/50 fields
- **Tape speed** 23.39 mm/s, Standard mode (3H)
- **Recording and playback time (with E-180 cassette)** 3 hours (Standard (3H) mode)
L12, L24, 24, 48, 72, 120, 168, 240, 480, 960 hours
However, L12/L24 can only be selected when an S-VHS tape is used.
(Timelapse mode: field recording)
- **Fast-forward/rewind time** Within about 4 min (with E-180 cassette)
- **Power supply** AC 220 V-240 V, 50 Hz/60 Hz
- **Power consumption** 19 watts
- **Dimensions** (W) 360 mm x (H) 115 mm x (D) 361 mm
- **Weight** Approx. 5.5 kg
- **Operating temperature** 5°C to 40°C
- **Operating humidity** 30%RH or more, 80%RH or less
- **Storage temperature** -20°C to 60°C

[Video System]

- **Signal input LINE S-VIDEO** 1.0 V(p-p), 75 Ω, unbalanced BNC
Y: 1.0 V(p-p), 75 Ω, unbalanced
C: 0.3 V(p-p), 75 Ω, unbalanced (Burst)
- **Signal output LINE S-VIDEO** 1.0 V(p-p), 75 Ω, unbalanced BNC
Y: 1.0 V(p-p), 75 Ω, unbalanced
C: 0.3 V(p-p), 75 Ω, unbalanced (Burst)
- **Horizontal resolution** 400 lines or more (S-VIDEO: 3H mode)
- **Video S/N** 43 dB or more (S-VHS: 3H mode)

[Audio system]

- **Number of tracks** 1 (normal)
- **Line input** -8 dBs, 50 kΩ, unbalanced RCA
- **Mic input** -67 dBs, 600 Ω, unbalanced
- **Line output** -8 dBs, 1 kΩ, unbalanced RCA
- **Frequency response** 100 Hz to 10 kHz (3H mode)
- **Audio S/N** 40 dB or more (3H mode at 4% distortion level)
- **Wow and flutter** 0.30% WRMS or less (3H mode)

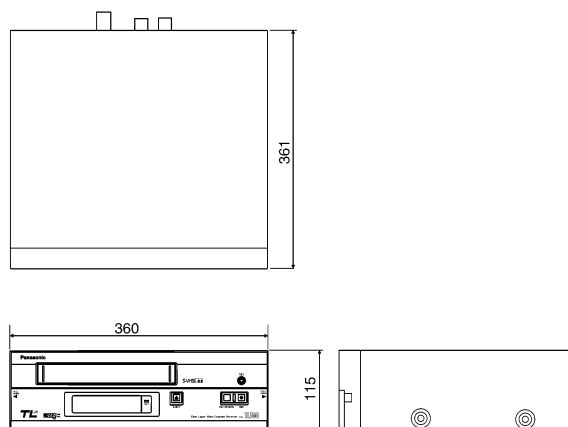
[Time/date]

- **Display** Day, month, year, hours, minutes, seconds, recording mode, alarm input data, power loss data
- **Display position** Variable
- **Character size** 16H
- **Power backup** Approx. two years (may be less depending on the operating environment)

[Alarm]

- **Alarm input** Input at ground level
- **Camera switching output** Negative pulse output (20 ms)
- **Accessory** mains cord x 1

Outer dimensions



Unit: mm

* Design and specifications subject to change without notice.

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SAFETY PRECAUTIONS

GENERAL GUIDELINES

1. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been over-heated or damaged by the short circuit.
2. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
3. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

LEAKAGE CURRENT COLD CHECK

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Measure the resistance value, with an ohm meter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. The resistance value must be more than 5MΩ.

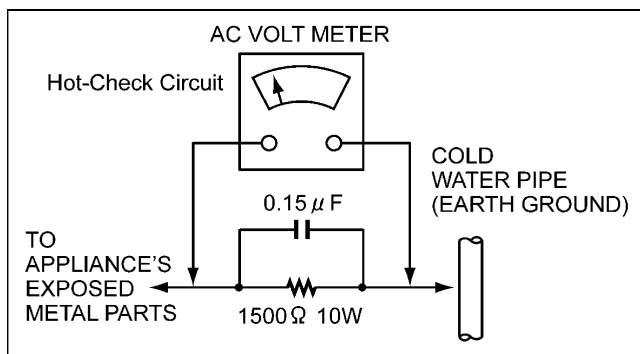


Figure1

LEAKAGE CURRENT HOT CHECK (See Figure 1)

1. Plug the AC cord directly into the AC outlet.
Do not use an isolation transformer for this check.
2. Connect a 1.5KΩ, 10W resistor, in parallel with a 0.15μ F capacitor, between each exposed metallic part on the set and a good earth ground such as a water pipe, as shown in Figure1.
3. Use an AC voltmeter, with 1000 ohms/volt or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet repeat each of the above measurements.
6. The potential at any point should not exceed 0.15 volts RMS. A leakage current tester (Simpson Model 229 equivalent) may be used to make the hot checks, leakage current must not exceed 0.1 milliamp. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

ELECTROSTATICALLY SENSITIVE (ES) DEVICES

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground.

Alternatively, obtain and wear a commercially available discharging wrist trap device, which should be removed for potential shock reasons prior to applying power to the unit under test.

2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it.
(most replacement ES devices are package with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
CAUTION : Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device).

X-RADIATION

WARNING

1. The potential source of X-radiation in EVF sets is the High Voltage section and the picture tube.
2. When using a picture tube test jig for service, ensure that jig is capable of handling 10kV without causing X-Radiation.

Note : It is important to use an accurate periodically calibrated high voltage meter.

3. Measure the High Voltage. The meter (electric type) reading should indicate 2.5kV,±0.15kV. If the meter indication is out of tolerance, immediate service and correction is required to prevent the possibility of premature component failure. To prevent an X-Radiation possibility, it is essential to use the specified picture tube.

Caution for AC Mains Lead

FOR YOUR SAFETY PLEASE READ THE FOLLOWING TEXT CAREFULLY.

FOR U.K. ONLY

This appliance is supplied with a moulded three pin mains plug for your safety and convenience.

A 5 amp fuse is fitted in this plug.

Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5 amps and that it is approved by ASTA or BSI to BS1362.

Check for the ASTA mark  or the BSI mark  on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.

If you lose the fuse cover the plug must not be used until a replacement cover is obtained.

A replacement fuse cover can be purchased from your local Panasonic Dealer.

IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY. THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13 AMP SOCKET.


If a new plug is to be fitted please observe the wiring code as shown below.

If in any doubt please consult a qualified electrician.

IMPORTANT: The wires in this mains lead are coloured in accordance with the following code:

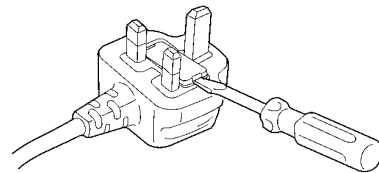
Blue:	Neutral
Brown:	Live

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

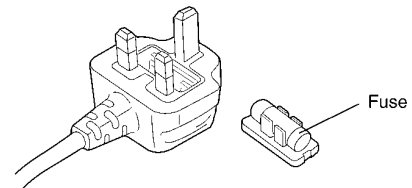
- The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.
- The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.
- Under no circumstances should either of these wires be connected to the terminal in the plug which is marked with the letter E or by the Earth symbol .

How to replace the fuse

1. Open the fuse compartment with a screwdriver.



2. Replace the fuse.



Lithium Battery

Warning

The lithium battery in this equipment must only be replaced by qualified personnel. When necessary, contact your local Panasonic supplier.

The lithium battery is a critical component.

It must never be subjected to excessive heat or discharge. It must therefore only be fitted in equipment designed specifically for its use.

Replacement batteries must be of the same type and manufacturer. They must be fitted in the same manner and location as the original battery, with the correct polarity connections observed.

Do not attempt to re-charge the old battery or re-use it for any other purpose. It should be disposed of in waste products destined for burial rather than incineration."

CAUTION

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.

VARNING

Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.

ADVARSEL

Eksplodingsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.

VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

CAUTION

- When you are not using the recorder for a long period of time, it is recommended that you disconnect the power cord from the mains outlet.
- Dangerous voltage inside. Refer internal servicing to qualified service personnel. To prevent electric shock or fire hazard, remove the power cord from the mains outlet prior to connecting or disconnecting any signal lead or aerial.

POWER SYSTEM

Connection to the mains supply

This unit operates on voltages of 220V to 240 V AC, 50 Hz or 60 Hz.

CAUTION

To prevent electric shock, do not open the cabinet. No user serviceable parts inside. Refer servicing to qualified service personnel.

Note:

The rating plate and the safety caution are on the rear of the unit.

The Stand-by button (⏻/I) does not completely shut off mains power from the unit.

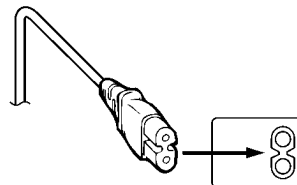
WARNING:

TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, KEEP THIS EQUIPMENT AWAY FROM ALL LIQUIDS-USE AND STORE ONLY IN LOCATIONS WHICH ARE NOT EXPOSED TO THE RISK OF DRIPPING OR SPLASHING LIQUIDS, AND DO NOT PLACE ANY LIQUID CONTAINERS ON TOP OF THE EQUIPMENT.

CAUTION:

Do not install or place this unit in a bookcase, built in cabinet or in another confined space in order to keep well ventilated condition. Ensure that curtains and any other materials do not obstruct the ventilation condition to prevent risk of electric shock or fire hazard due to overheating.

CAUTION

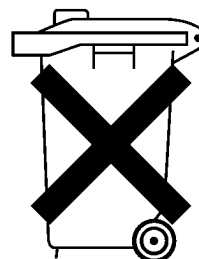


- To prevent electric shock and to avoid damaging the unit, first insert the smaller plug on the AC mains cord into the VCR, making sure that it is securely connected, and then plug the larger end of the AC mains cord into a mains socket.

Attention/Attentie

A battery is used for memory-backup in the unit. When the battery is exhausted, you should not throw it away, but dispose of it as small chemical waste.

Voor het reservegeheugen van het apparaat wordt gebruikgemaakt van een batterij. Wanneer de batterij is uitgeput, mag u deze niet gewoon weggooien, maar dient u deze als klein chemisch afval weg te doen.



SECTION 1

SERVICE CAUTIONS AND DISASSEMBLY

1.1 DISASSEMBLY OF MAJOR PARTS

1.1.1 Disassembly Flow Chart

The following flow chart shows the disassembly procedures for the PC board assembly diagnostics and mechanism diagnostics. Be sure to unplug the power cord before disassembling or assembling the products.

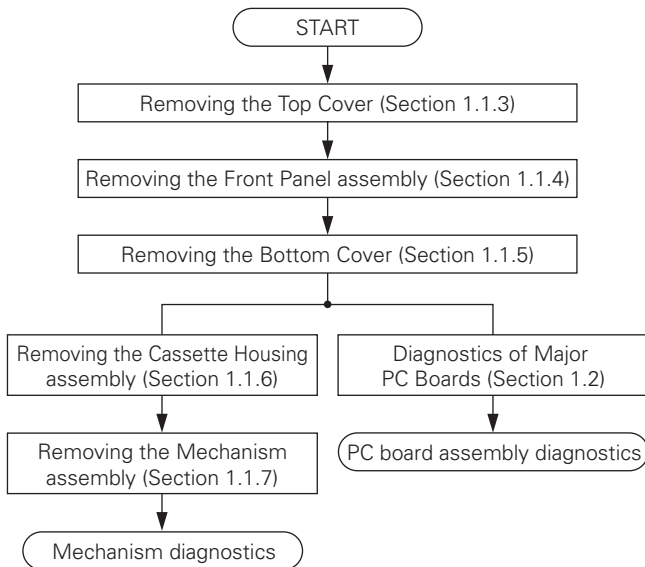


Fig. 1-1-1

1.1.2 Replacing the Fuse

CAUTION

Before replacing a fuse and in order to prevent a recurrence of the same trouble, investigate what caused the fuse to blow, repair it and confirm normal operation. To protect the equipment and provide safety, be sure to replace with a fuse having the specified part number.

- (1) Set the power switch to OFF and unplug the power cord from the power outlet before replacing the fuse.
- (2) Remove the top cover (see section 1.1.3).
- (3) Fuse F1 is located on the SW REG board.

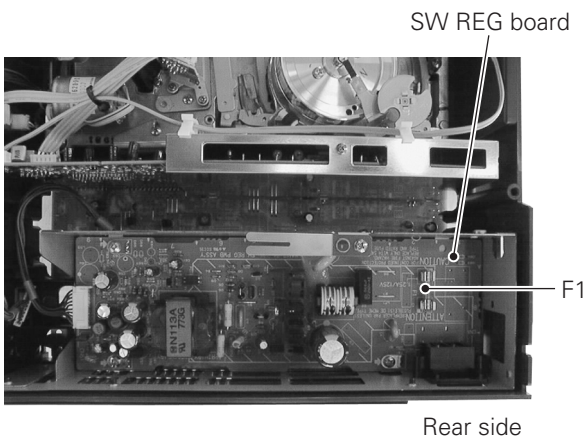


Fig. 1-1-2

1.1.3 Removing the Top Cover

- (1) Remove the 4 screws (S1).
- (2) Remove the top cover by sliding it in the direction of arrow.

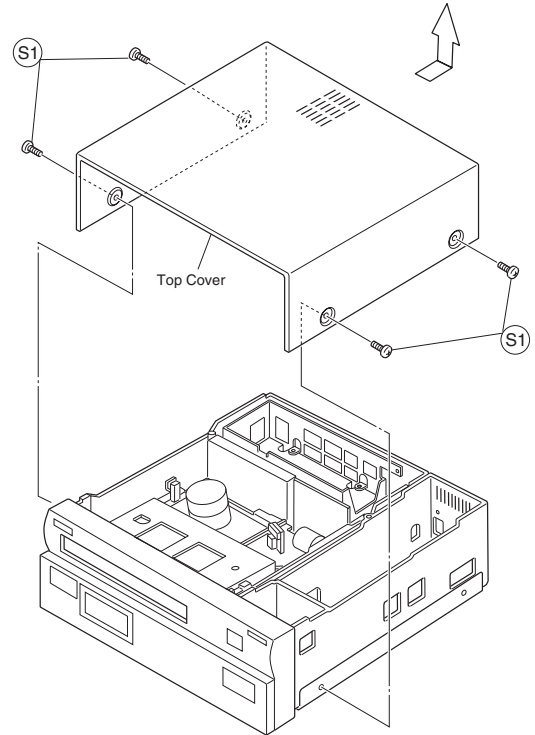


Fig. 1-1-3

1.1.4 Removing the Front Panel Assembly

- (1) Remove the top cover as described in section 1.1.3.
- (2) Disengage the 4 hooks (A) on the front panel assembly from the chassis.

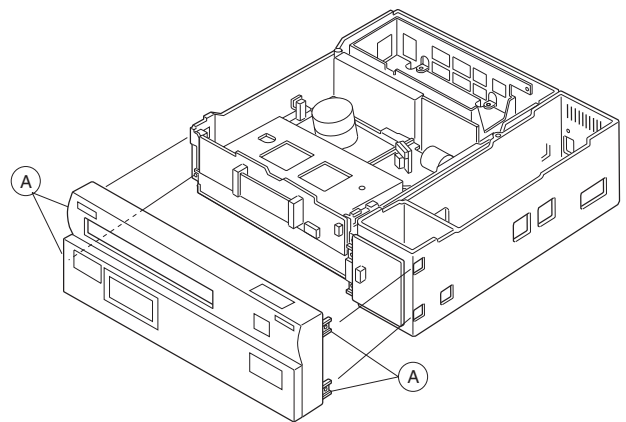


Fig. 1-1-4

1.1.5 Removing the Bottom Cover

- (1) Remove the top cover as described in section 1.1.3.
- (2) Remove the screw (S2).

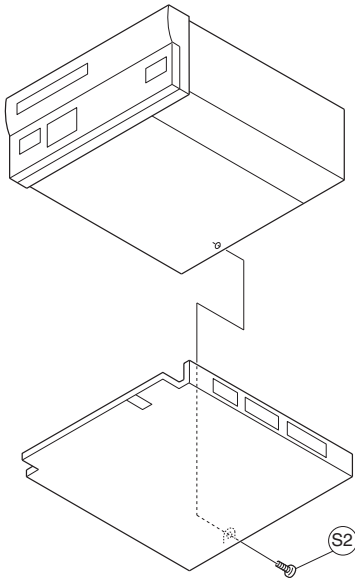


Fig. 1-1-5

1.1.6 Removing the Cassette Housing Assembly

- (1) Remove the top cover and front panel assembly as described in sections 1.1.3 and 1.1.4.
- (2) Remove the 2 screws (S3), screw (S4) and screw (S5).
- (3) Remove the cassette housing assembly by pulling the left edge of the assembly in the direction of the arrow ↑.

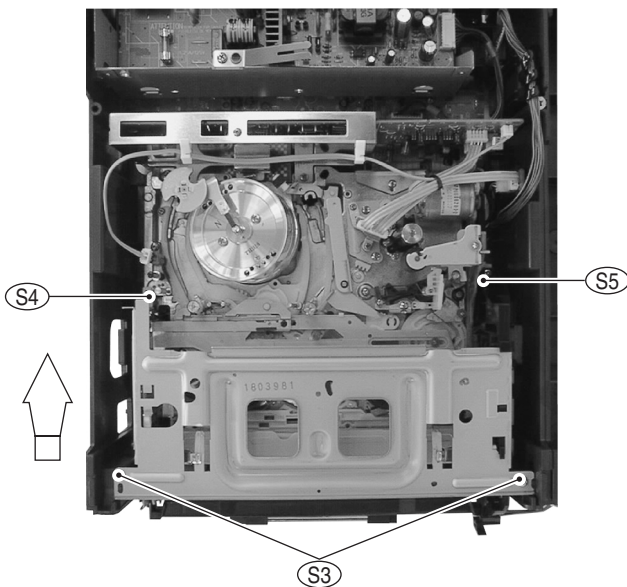


Fig. 1-1-6(a)

- (4) When attaching the cassette housing assembly, take care that the switch lever does not accidentally switch the REC SAFETY switch knob from above.

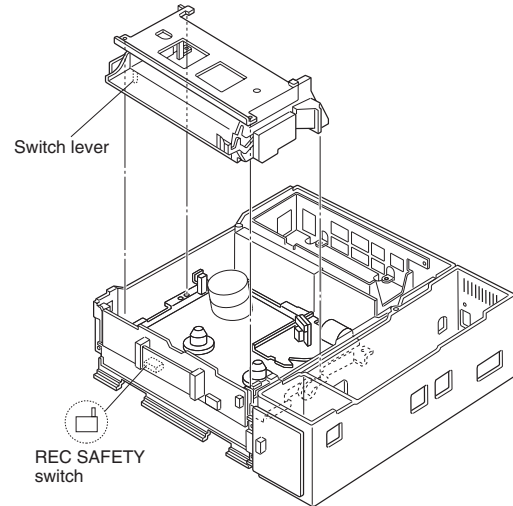


Fig. 1-1-6(b)

1.1.7 Removing the Mechanism Assembly

- (1) Remove the top cover, front panel assembly and bottom cover as described in sections 1.1.3, 1.1.4 and 1.1.5.
- (2) Remove the 2 screws (S6) from the rear panel.

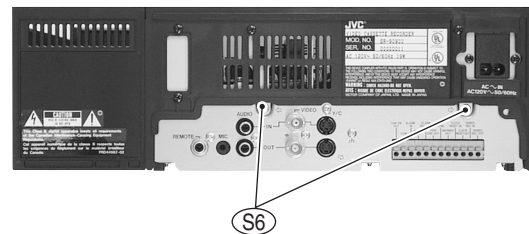


Fig. 1-1-7(a)

- (3) Remove the screw (S7) from the MAIN board, pushing the hook (B) gently in the direction of arrow ↑, then tilt the board in the direction of the arrow ⇨.

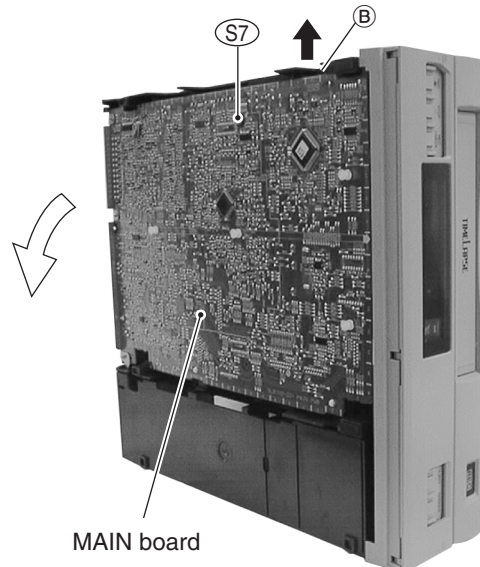


Fig. 1-1-7(b)

- (4) Unplug the connectors (C), (D), (E) and (F).

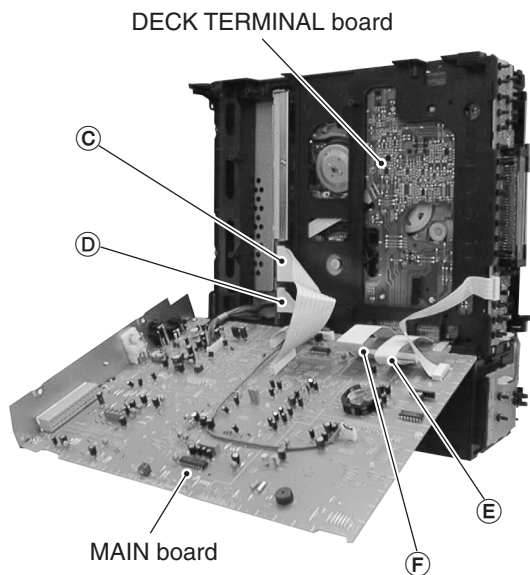


Fig. 1-1-7(c)

- (5) Unplug the connector (G).
 (6) Remove the 2 screws (S8) and 2 screws (S9), then remove the mechanism assembly in the upward direction.

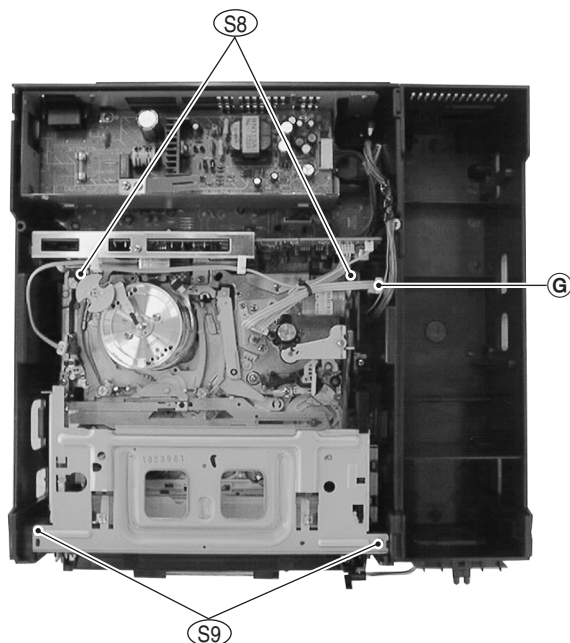


Fig. 1-1-7(d)

1.2 DIAGNOSTICS OF MAJOR PC BOARDS

1.2.1 Diagnosing the MAIN and DECK TERMINAL Boards

- (1) Remove the top cover and bottom cover as described in sections 1.1.3 and 1.1.5.
 (2) As described in section 1.1.7, disassemble the unit as shown in Figs. 1-1-7 (b) and (c) before proceeding to the diagnostics of these PC boards.

1.2.2 Diagnosing the FRONT 1 and FRONT 2 Boards

- (1) Remove the top cover and front panel assembly as described in sections 1.1.3 and 1.1.4.
 (2) Remove the FRONT 1 and FRONT 2 boards by pushing the 2 hooks (H) and 1 hook (J) gently in the direction of arrows ↑, then remove the FRONT 1 and FRONT 2 boards and diagnose them.

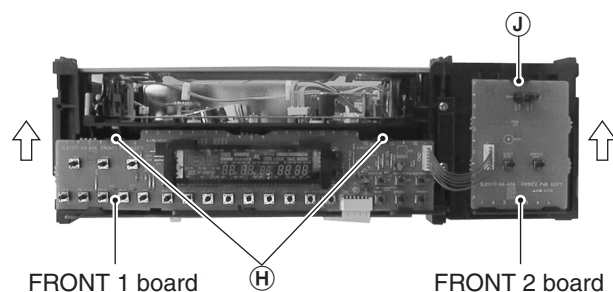


Fig. 1-2-2

1.2.3 Diagnosing the SW REG. Board

CAUTION

The supply voltage is input directly into the SW REG. board ass'y. Be careful not to get an electric shock while diagnosing and servicing.

- (1) Remove the top cover as described in section 1.1.3.
 (2) Remove the 2 screws (S10).

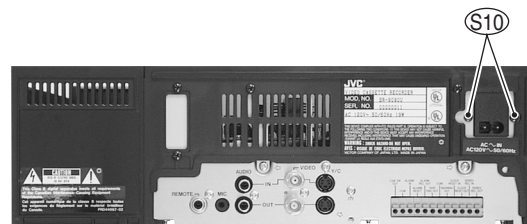


Fig. 1-2-3(a)

- (3) Remove the 3 screws (S11), remove the SW REG. board in an upward direction and diagnose it.

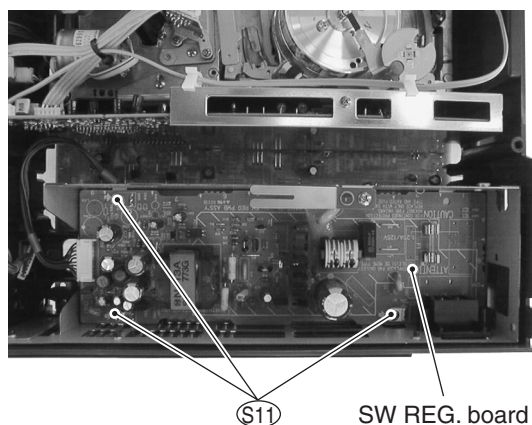


Fig. 1-2-3(b)

1.2.4 Diagnosing the P/R Board

- (1) Remove the top cover as described in section 1.1.3.
 (2) Remove the 4 screws (S12) and 2 screws (S13).

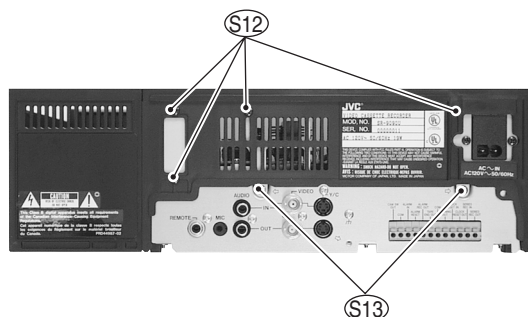


Fig. 1-2-4(a)

- (3) Remove the wire from the clamp (K), remove the screw (S14), then remove the shielded case (P/R) (L) in an upward direction.
 (4) Remove the shielded case (REG) (M) in an upward direction and diagnose the P/R board.

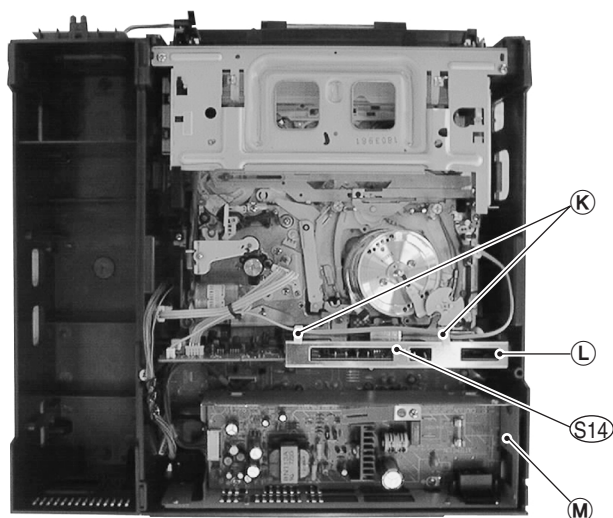


Fig. 1-2-4(b)

1.2.5 Replacing the Lithium Battery

- (1) Tilt the MAIN board as described in section 1.1.7 (1), (2) and (3).
 (2) Remove the lithium battery by pushing it lightly in the direction of the arrow ⇨.

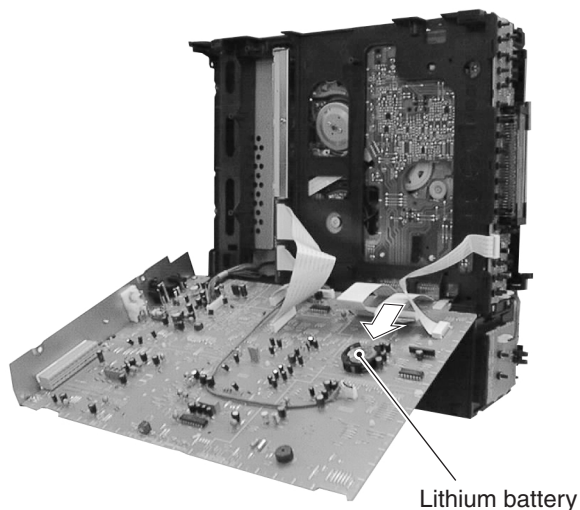


Fig. 1-2-5

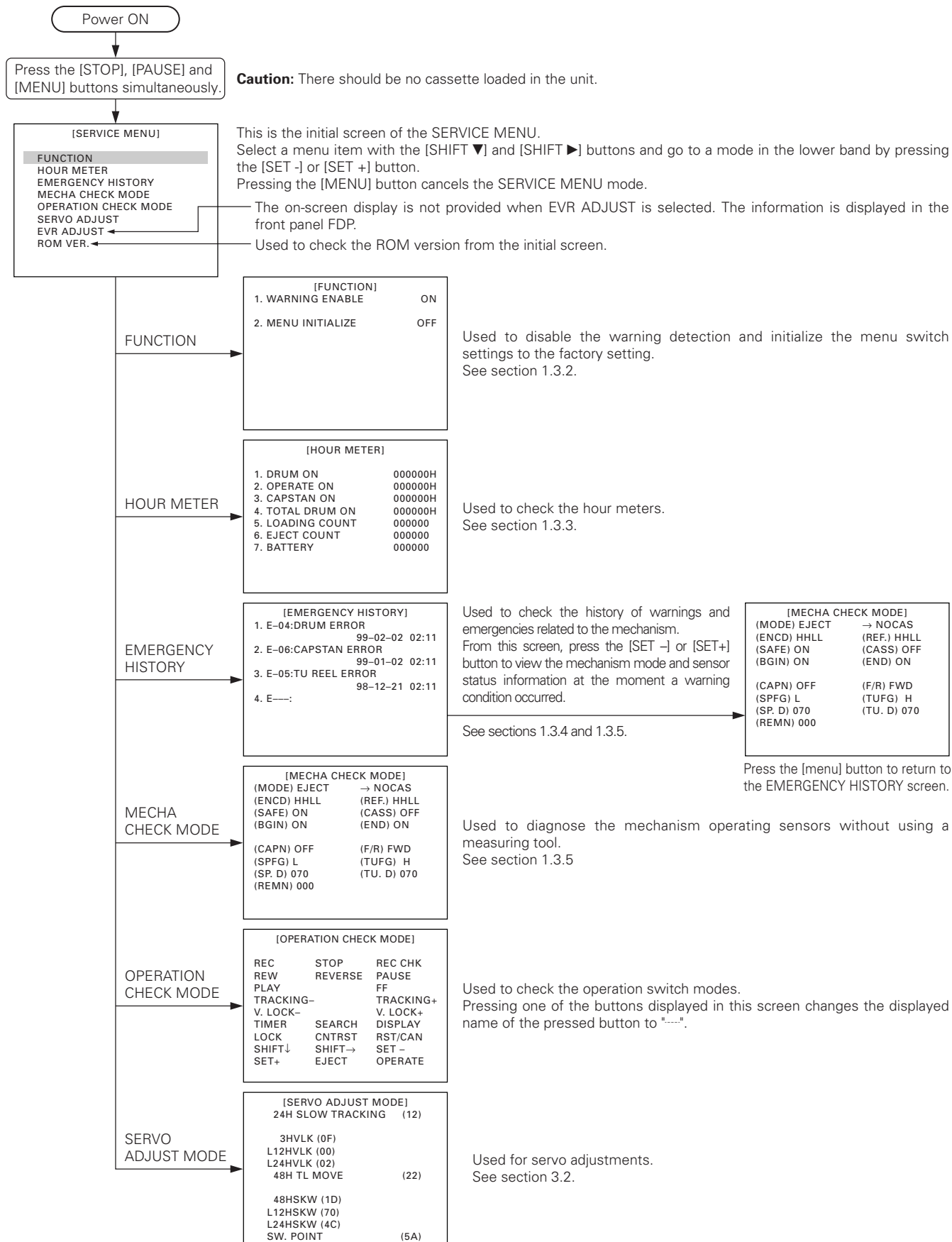
CAUTION

- Read the notes on the lithium backup battery in section 1.4.

1.3 SERVICE MENU

1.3.1 Menu Configuration and Operation Procedure

The SERVICE MENU mode is used during servicing. It is configured as shown below.



1.3.2 Function

Item	Setting	Description
1. WARNING ENABLE	[ON]	Enables warning detection.
	OFF	Disables warning detection.
2. MENU INITIALIZE		Initializes the service menu switch setting to the factory setting. Pressing the [STOP] and [RESET/CANCEL] buttons simultaneously when the cursor is located on "MENU INITIALIZE" resets the menu switch setting to the factory setting and changes the display from OFF to ON.

[] indicates the factory setting.

Table 1-3-3

1.3.3 Hour meter

This screen is used to check the hour meters.

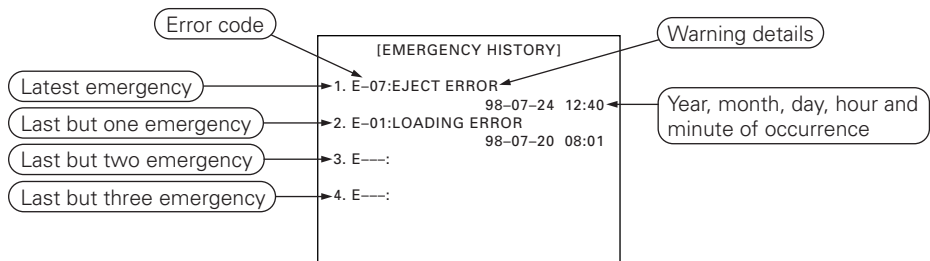
[HOUR METER]	
1. DRUM ON	000000H
2. OPERATE ON	000000H
3. CAPSTAN ON	000000H
4. TOTAL DRUM ON	000000H
5. LOADING COUNT	000000
6. EJECT COUNT	000000
7. BATTERY	000000

Item	Display	Description
1. DRUM ON	dh	Displays the drum rotation time.
2. OPERATE ON	Ph	Displays the operating time.
3. CAPSTAN ON	Ch	Displays the capstan rotation time.
4. TOTAL DRUM ON	td	Displays the total drum rotation time.
5. LOADING COUNT	Lc	Displays the number of loading operations.
6. EJECT COUNT	Ec	Displays the number of ejection operations.
7. BATTERY	bt	Allows writing of the current date data. Press the [RESET/CANCEL], [SET +] and [SET -] buttons simultaneously while the cursor is located on "BATTERY" to write the current date. This must be executed after the lithium battery replacement.

Table 1-3-4

1.3.4 Emergency history

This screen is used to check the history of warning emergencies related to the mechanism. The emergency history is written in the EEPROM (IC607 on the MAIN board) and records the history of the latest 4 emergencies.
Press the [STOP], [PAUSE] and [CNT RESET] buttons simultaneously while the emergency history is displayed to reset the history.



Error Code	Display	Description	Sensors	Detection Method	Possible Causes	Operation after Detection
E-01	LOADING ERROR	Loading does not complete.	Rotary encoder ↓ MAIN board IC606 ④ LS1 ⑤ LS2 ⑥ LS3 ⑦ LS4	CPU checks the rotary encoder output to see the mechanism position data and identifies the error when loading does not complete in 8 seconds.	Loading motor failure, MDA (IC602 on MAIN board) failure, Power (MOTOR 12 V) defect, Circuit protector (CP601 on MAIN board) disconnection, Loading belt defect, Mechanism part caught or stuck, Cassette tape defect.	Power goes off automatically.
E-02	UNLOADING ERROR	Unloading does not complete.		CPU checks the rotary encoder output to see the mechanism position data and identifies the error when unloading does not complete in 8 sec.		Power goes off automatically.
E-03	SP REEL ERROR	Supply reel does not rotate.	Supply reel FG ↓ MAIN board IC601 ① SUP FG	CPU identifies error when supply reel FG has not been detected for specified period of time in a mode in which the SP reel should rotate. 3H : Approx. 5 sec. L12H : Approx. 18 sec. L24H : Approx. 36 sec. 24H : Approx. 36 sec. 48H : Approx. 72 sec. 72H : Approx. 2 min. 120H : Approx. 3 min. 168H : Approx. 4 min. 240H : Approx. 6 min.	Capstan motor or drive circuit defect, Belt (Capstan), clutch ass'y or idler gear unit defect, Tape cut.	Power goes off automatically.
E-04	DRUM ERROR	Drum motor does not rotate.	Drum PG/FG ↓ MAIN board TP616 DPG	CPU identifies error when drum FG has not been detected for more than 3 seconds in a mode in which the drum motor should rotate.	Drum ass'y defect, Servo circuit defect, Power (MOTOR 12 V) defect, Circuit protector (CP601 on MAIN board) disconnection.	Power goes off automatically.
E-05	TU REEL ERROR	Take-up reel does not rotate.	Take-up reel FG ↓ MAIN board IC601 ② TU FG	CPU identifies error when take-up reel FG has not been detected for specified period of time in a mode in which the TU reel should rotate. 3H : Approx. 5 sec. L12H : Approx. 18 sec. L24H : Approx. 36 sec. 24H : Approx. 36 sec. 48H : Approx. 72 sec. 72H : Approx. 2 min. 120H : Approx. 3 min. 168H : Approx. 4 min. 240H : Approx. 6 min.	Capstan motor or drive circuit defect, Belt (Capstan), clutch ass'y or idler gear unit defect, Tape cut.	Power goes off automatically.
E-06	CAPSTAN ERROR	Capstan motor does not rotate.	Capstan FG ↓ MAIN board TP617 CFGA	CPU identifies error when capstan FG has not been detected for more than 2 seconds when pinch roller is ON in a mode in which the capstan should rotate.	Capstan motor defect, Servo circuit defect, Power (MOTOR 12 V) defect, Circuit protector (CP601 on MAIN board) disconnection.	Power goes off automatically.
E-07	EJECT ERROR	Ejection does not occur.	Cassette sensor ↓ MAIN board IC606 ⑭ ----- REC SAFETY switch ↓ MAIN board IC606 ⑮	When ejection does not complete in 8 seconds. Cassette sensor output should be 0 V at the intake end position and 5 V in other positions. REC SAFETY switch should be 0 V during ejection and 5 V at the eject end position.	Cassette housing failure, Worm clutch ass'y defect, Power (MOTOR 12 V) defect, Circuit protector (CP601 on MAIN board) disconnection.	Cassette is absorbed then power goes off automatically.
E-08	DEW ERROR	Condensation of dew.	DEW sensor ↓ MAIN board IC601 ⑯	Dew error caused by condensation is identified when pin 86 of IC601 is higher than 4 V. Dew error disappears when pin 86 of IC601 is lower than 3V.	If the error display does not disappear, the dew sensor may be defective.	Cassette is ejected, drum starts rotation and cassette will not be accepted until the condensation disappears.
E-13	TAPE DEFECTIVE	Tape is cut.	Begin sensor ↓ MAIN board IC601 ⑰ BEGIN ----- End sensor ↓ MAIN board IC601 ⑱ END	This error is identified when both the tape begin and end sensors detect leader (the level becomes Low) when a cassette is inserted.	Tape cut, Sensor defect.	Cassette is ejected then power goes off automatically.

Table 1-3-4(a)

Warning Situations That Are Not Recorded in the Emergency History

In case of the following errors, the applicable error code is displayed in the FDP on the front panel.

Error Code	Description	Sensors	Detection Method	Possible Causes	Operation after Detection
E-09	Recording check error	Pre-amp. circuit ↓ MAIN board IC601 ⑥7	This error is identified when recording check finds that the played FM level is low (pin 87 of IC601 is below 0.4 V).	Video head is dirty or its service life expired. Preamplifier circuit failure.	E-09 is displays about 10 seconds. The cleaner should be activated.
E-10	Backup battery low power error	Battery ↓ MAIN board IC608 ③	This error is identified when the battery voltage is below 2.75 V.	Battery capacity is insufficient. Battery is not loaded.	E-10 is displays when power is switched OFF.
E-11	Video signal input error	MAIN board IC601 ⑤0	This error is identified when there is no video input at VIDEO IN jack.	Video signal is not supplied.	E-11 is displayed when power is switched ON.
E-12	EEPROM write error	MAIN board IC601 ①7/①8	This error is identified when a verification error occurs after EEPROM write.	EEPROM defect, CPU → EEPROM communication line defect.	E-12 is displayed when power is switched ON.

Table 1-3-4(b)

1.3.5 Mecha check mode

This screen is used to diagnose the mechanism operation sensors without using a measuring tool.

[MECHA CHECK MODE]
 (MODE) EJECT → NOCAS
 (ENCD) HHLL (REF.) HHLL
 (SAFE) ON (CASS) OFF
 (BGIN) ON (END) ON

 (CAPN) OFF (F/R) FWD
 (SPFG) L (TUFG) H
 (SP. D) 070 (TU. D) 070
 (REMN) 000

Item	Displayed Information	Input Pin	Check Method																												
(MODE)	Previous and current modes of the VCR.	—	<table> <tr> <th>Display</th><th>Description</th><th>Display</th><th>Description</th></tr> <tr> <td>ATOFF</td><td>→ AUTO OFF</td><td>PLAY</td><td>→ PLAY</td></tr> <tr> <td>OPOFF</td><td>→ OPERATE OFF</td><td>RPLAY</td><td>→ REVERSE</td></tr> <tr> <td>NOCAS</td><td>→ NO CASSETTE</td><td>STOP</td><td>→ STOP</td></tr> <tr> <td>EJECT</td><td>→ EJECT</td><td>STILL</td><td>→ STILL</td></tr> <tr> <td>FF</td><td>→ FF</td><td>S.FWD</td><td>→ SHUTTLE FWD</td></tr> <tr> <td>REW</td><td>→ REW</td><td>R.REV</td><td>→ SHUTTLE REV</td></tr> </table>	Display	Description	Display	Description	ATOFF	→ AUTO OFF	PLAY	→ PLAY	OPOFF	→ OPERATE OFF	RPLAY	→ REVERSE	NOCAS	→ NO CASSETTE	STOP	→ STOP	EJECT	→ EJECT	STILL	→ STILL	FF	→ FF	S.FWD	→ SHUTTLE FWD	REW	→ REW	R.REV	→ SHUTTLE REV
Display	Description	Display	Description																												
ATOFF	→ AUTO OFF	PLAY	→ PLAY																												
OPOFF	→ OPERATE OFF	RPLAY	→ REVERSE																												
NOCAS	→ NO CASSETTE	STOP	→ STOP																												
EJECT	→ EJECT	STILL	→ STILL																												
FF	→ FF	S.FWD	→ SHUTTLE FWD																												
REW	→ REW	R.REV	→ SHUTTLE REV																												
(ENCD)	Rotary encoder output level.	MAIN board IC606 ④ LS1 IC606 ⑤ LS2 IC606 ⑥ LS3 IC606 ⑦ LS4	<p>The H/L display varies according to the mechanism position.</p> <p>(ENCD)</p>																												
(REF.)	Normal output level of rotary encoder.	—	<p>(REF.)</p>																												
(SAFE)	REC SAFETY switch status.	MAIN board IC606 ①5	<p>ON: When a cassette with a broken safety tab is inserted or during cassette loading/ejection.</p> <p>OFF: When a cassette with integral safety tab is inserted or when no cassette is loaded.</p>																												
(CASS)	Cassette switch status.	MAIN board IC606 ①4	<p>ON: When a cassette is inserted.</p> <p>OFF: When no cassette is loaded or during cassette loading/ejection.</p>																												
(BGIN)	Tape begin sensor status.	MAIN board IC601 ②0	<p>ON: When the leader tape is detected or when no cassette is loaded.</p> <p>OFF: When the magnetic tape section is detected.</p>																												
(END)	Tape end sensor status.	MAIN board IC601 ②1	<p>ON: When the leader tape is detected or when no cassette is loaded.</p> <p>OFF: When the magnetic tape section is detected.</p>																												
(CAPN)	Capstan motor operation mode.	MAIN board TP617	<p>ON: When the capstan motor is rotating.</p> <p>OFF: When the capstan motor is stopped.</p>																												
(F/R)	Capstan motor rotation direction.	MAIN board TP610	<p>FWD: During forward rotation.</p> <p>REV: During reverse rotation.</p>																												
(SPFG)	SP reel FG sensor status.	MAIN board IC601 ①	<p>H/L are alternated when the reel disk rotates. The alternation rate increases when the rotation speed increases.</p>																												
(TUFG)	TU reel FG sensor status.	MAIN board IC601 ②																													
(SP. D)	SP reel winding diameter (in mm).	—																													
(TU. D)	TU reel winding diameter (in mm).	—																													
(REMN)	Current remaining tape (in min.) assuming that the tape speed is SP.	—	<p>If the tape speed during FF or REW operation does not decelerate near the end or the beginning of the tape, the detection by one of these sensors may be defective.</p> <p>In this case, check if the reel FG and capstan FG signals are supplied normally to the CPU.</p>																												

Table 1-3-5(a)

Switch and Sensor Layout

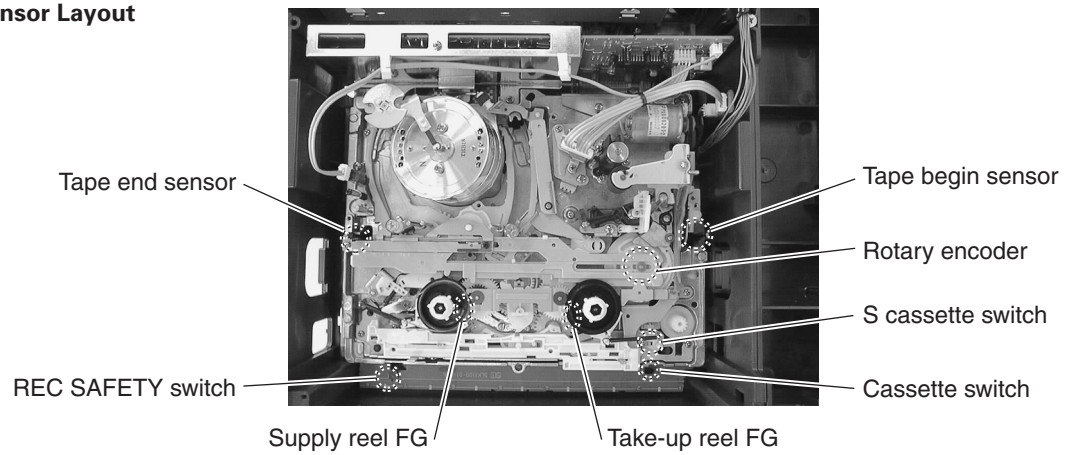


Fig. 1-3-5(b)

Mechanism Mode Chart

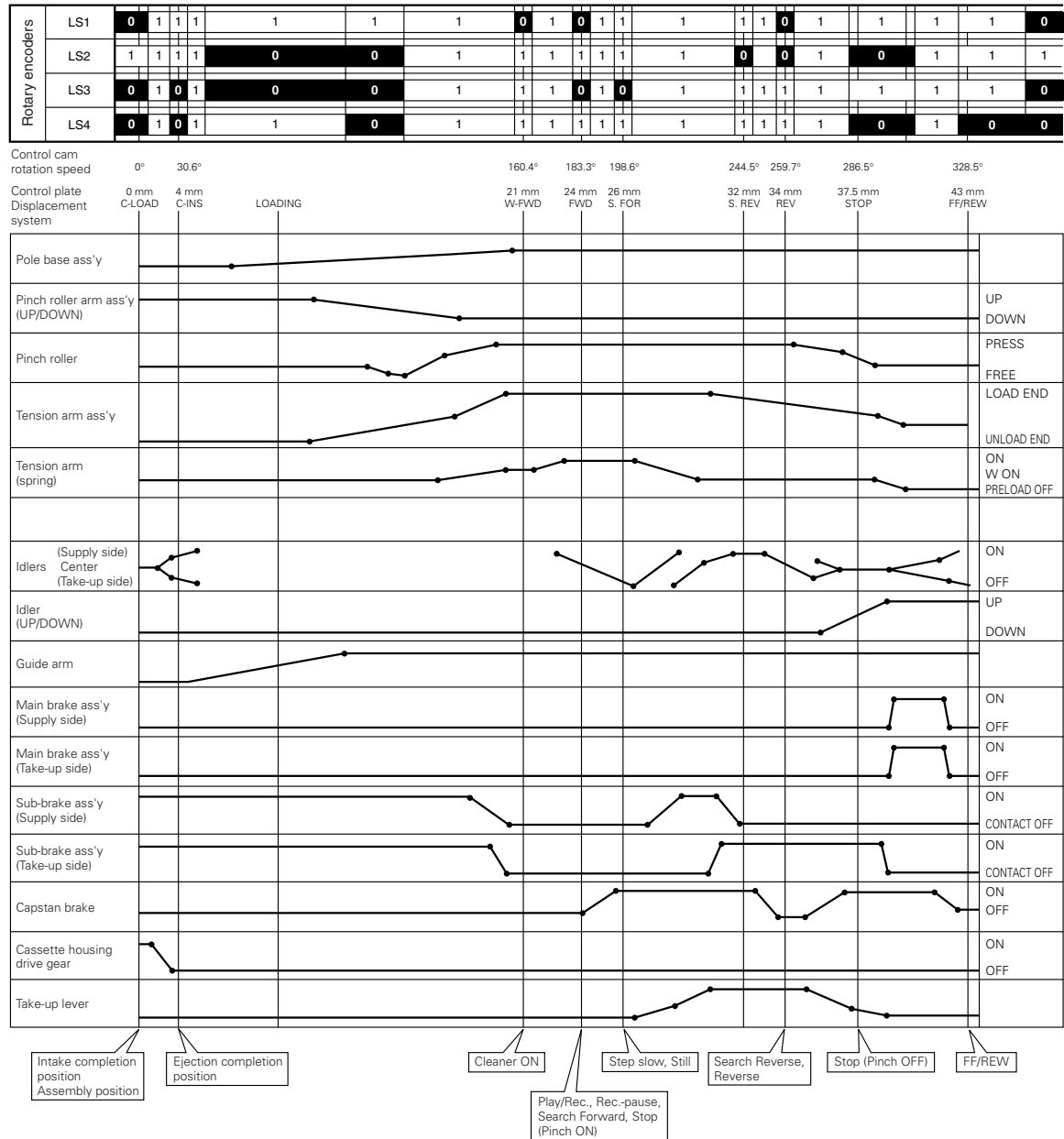


Fig. 1-3-5(c)

1.4 LITHIUM BACKUP BATTERY

1.4.1 Battery Replacement Caution

Do not leave the unit without restoring the power supply after the lithium battery has been replaced with the power cord unplugged, as this causes the backup current to flow continuously and the lithium battery life will be reduced. Be sure to turn the power ON after replacing the lithium battery.

The unit incorporates a function for storing the date of a lithium battery replacement in the memory. After replacing the lithium battery, also be sure to execute this function by referring to "7. BATTERY" in section 1.3.3

1.4.2 Time/Date Backup

When the power supply to the unit has failed due to an electrical power failure or the unplugging of the power cord, this unit uses the lithium battery to back up the CPU (IC601 on the MAIN board) in order to protect the clock operation and set data. Typically a lithium battery is capable of backing up the memory data for about 2 years. When the lithium battery voltage drops below 2.85 V, this unit displays an error message "E-10" to notify the replacement timing. When the lithium battery is replaced with the power cord unplugged, the CPU will be reset. In this case, the time setting of the unit after the battery replacement is reset.

1.5 EEPROM

IC607 on the MAIN board is an EEPROM capable of electrical erasure/write operations. This EEPROM stores the following data.

(1) Hour meter data

Data as displayed under item "HOUR METER" in the SERVICE MENU, and the "HOUR METER" data in the user menu.

(2) Adjustment data

Data of the adjustment items displayed under items "SERVO ADJUST" and "EVR ADJUST" in the SERVICE MENU.

When EEPROM is replaced, reset the adjustment data of the EVR ADJUST before performing all the adjustments shown in the following tables.

* For the resetting method of the EVR ADJUST adjustment data, see section 3.3.2 (7).

① SERVO ADJUST

Section	Adjustment Item
3.4.1	SW point adjustment
3.4.2	V-lock adjustment
3.4.3	Slow tracking preset adjustment
3.4.4	Skew adjustment

② EVR ADJUST

Section	Adjustment Item
3.5.1	AGC level adjustment
3.5.3	Sub-emphasis input level adjustment
3.5.4	White & dark clip adjustment
3.5.5	Carrier & deviation adjustments
3.5.6	S-VHS ET SP REC FM level adjustment
3.5.7	S-VHS SP REC FM level adjustment
3.5.8	Pilot burst level adjustment
3.5.9	S-VHS PB Y level adjustment
3.5.11	S-VHS ET SP REC color level adjustment
3.5.12	S-VHS SP REC color level adjustment

(3) Emergency history data

Data of the history of the last 4 emergencies as displayed under item "EMERGENCY HISTORY" in the SERVICE MENU.

(4) Menu switch setting data

Data set under item "FUNCTION" in the SERVICE MENU, and setting data in the user menu.

1.6 CIRCUIT PROTECTORS

The MAIN board has circuit protectors as shown in Fig. 1-6.

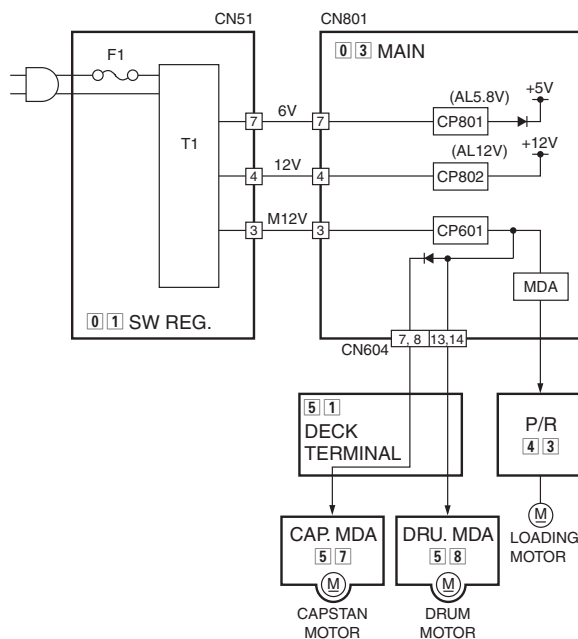


Fig. 1-6

Table 1-6 shows symptoms when each circuit protector wire is disconnected.

Symbol No.	Board Address	Symptom
CP601	16E	Loading motor and drum motor do not rotate. When a cassette tape is not inserted, warning message "E-01" is displayed. When a cassette tape is inserted, warning message "E-02" is displayed.
CP801	16C	The information is not displayed in the front panel FDP.
CP802	17D	Operate on is impossible. Drum motor does not rotate. When a cassette tape is inserted, warning message "E-02" is displayed.

Table 1-6

1.7 RESETTING THE MICROCOMPUTER IN CASE OF A RUNAWAY

This unit uses a lithium battery to back up the microcomputer (IC601 on the MAIN board). Therefore, in case the microcomputer runs away, simply unplugging the power cord does not reset it but it is also required to remove the lithium battery temporarily as described in section 1.2.5

SECTION 2

MECHANISM REPAIR/ADJUSTMENT PROCEDURES

2.1 BEFORE MAKING REPAIR/ADJUSTMENT

2.1.1 Precautions

- (1) When using the soldering iron, be sure to disconnect the power cord of the main unit from the AC outlet beforehand.
- (2) Pay attention not to damage the wires when connecting/disconnecting the connectors.
- (3) Do not touch the parts around the adjustment point because of wrongly specifying the defective point.
- (4) Pay special attention not to injure claws, etc. by accident during the repair operation.
- (5) When mounting the cassette housing assembly, set the unit exclusively to the mechanism assembly position. (Refer to Section 2.3.2.)
- (6) When remove any slit washers, replace them new one.

2.1.2 How to unload the cassette tape manually

When the unit malfunctions with the cassette tape being left loaded and the cassette tape cannot be ejected, remove the cassette tape in the following manner:

- (1) Be sure to disconnected the power cord and remove the top cover.
- (2) For unloading, rotate the loading motor in the main deck assembly manually toward you. At this time, unload the tape by rotating the capstan motor clockwise and winding the tape so that the grease does not come into contact with the slackened tape.
- (3) When the tape comes to the position where the pole base assemblies (supply side, take-up side) and guide arm assembly are hidden by the cassette shell, stop rotating the capstan motor, and check that the tape is fully wound up.
- (4) When the capstan motor is further rotated counterclockwise, the cassette housing is ejected, then the cassette tape may be removed.

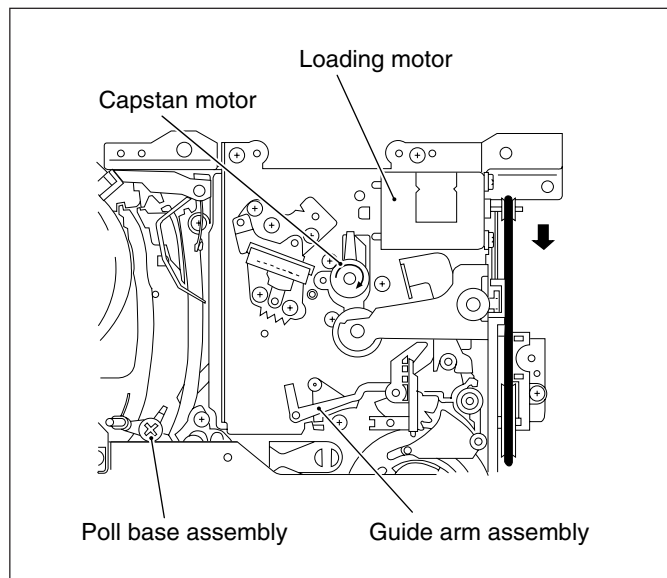


Fig. 2-1-1

2.1.3 Special tools Required for Adjustment

Alignment tape (SP) VFK1741	Alignment tape VFK1742
Cassette torque meter VFK1744	A/C head position bit VFK1745
Roller driver VFK1746	Grease VFK1748 / VFK1749 / VFK1750 Oil VFK1751
Parallel check plate (0.05) VFK1747	

Table 2-1-1 Special tools required for adjustment

2.1.4 Specifications of alignment tape

• VFK1741

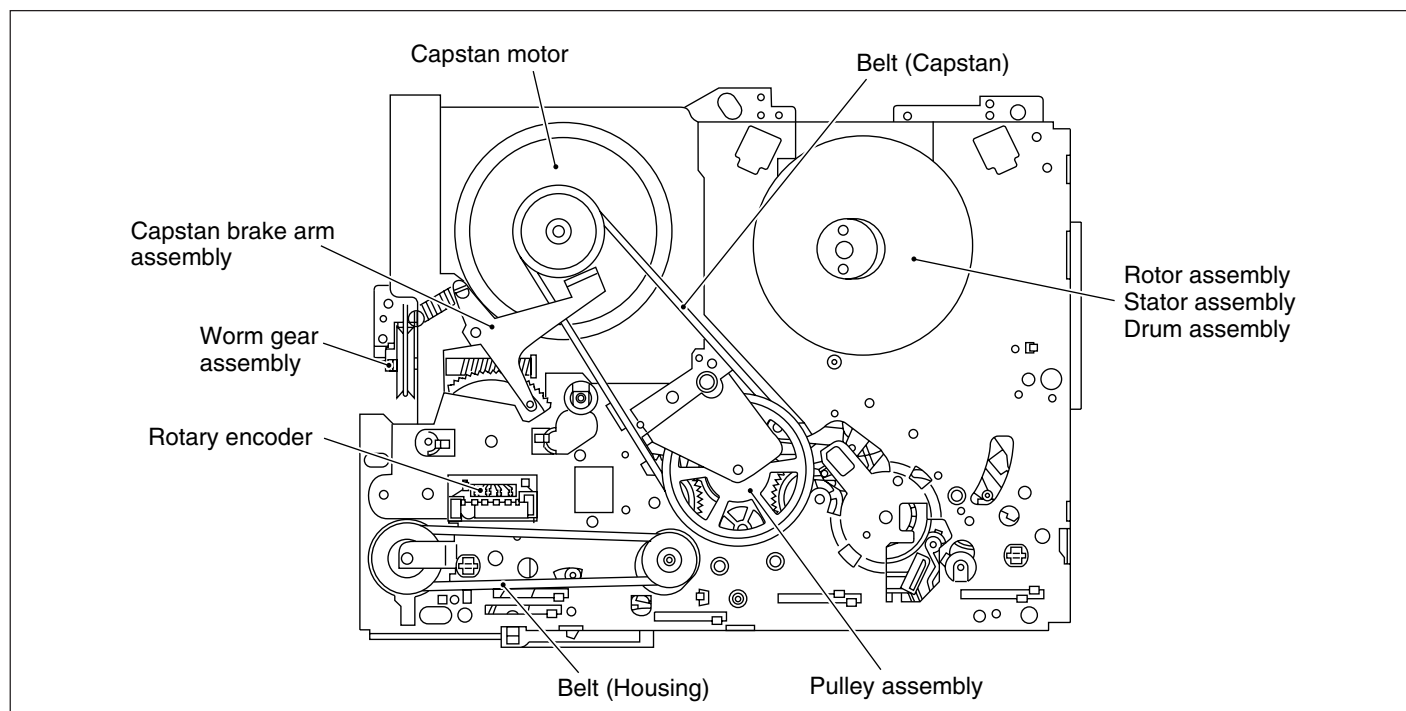
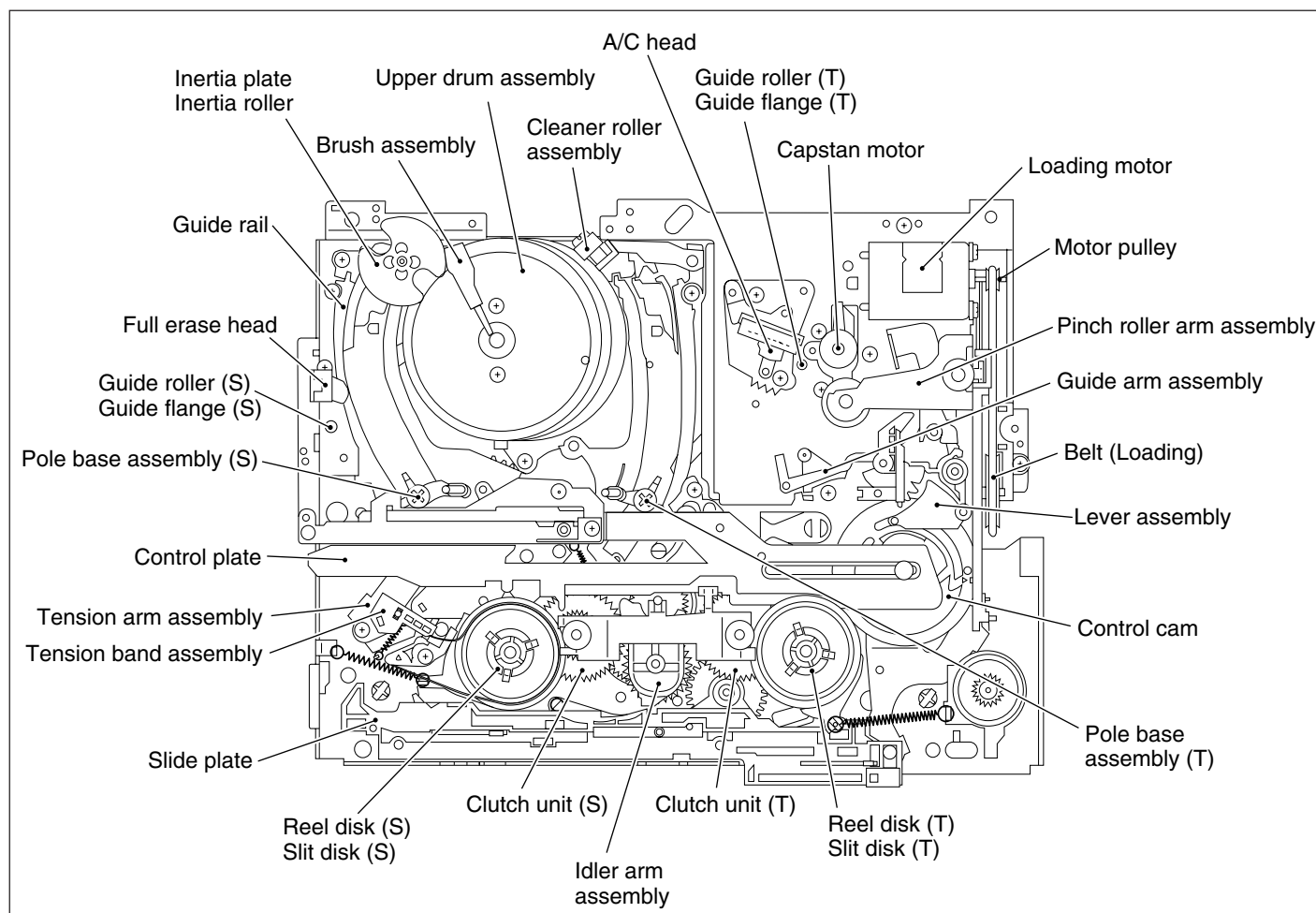
Video Signal	Audio Signal	Applications
VHS SP Stairstep	6 kHz	<ul style="list-style-type: none"> • Interchangeability adjustment • PB switching point adjustment.

• VFK1742

Video Signal	Audio Signal	Applications
VHS SP Stairstep (1 field per 5 frame does not contain video and audio)	6 kHz	<ul style="list-style-type: none"> • X-value adjustment

2.2 MAINTENANCE AND CHECK

2.2.1 Location of main mechanical parts



2.2.2 Maintenance of main parts and periodical reference

This reference chart is based on the following status (see notes* below) and the service life (maintenance interval) may greatly differ depending on the environmental or using conditions. If the maintenance check is not performed correctly, the service

life shown in the following chart will be greatly reduced and it could affect the other units. However, it is recommended that rubber parts are replaced every three years as these could be affected by aging.

Category	Part Name		Symbol No. of Part and it appears in	Standard Service Period (Operation Hours)			Remarks
				every 500 hours	every 4000 hours	every 8000 hours	
Tape transport system	1	TAPE TRANSPORT PART	—	★	★	★	—
	2	GUIDE FLANGE (S, T)	M4-26	★	○★	○★	2.3.19
	3	FULL ERASE HEAD	M4-82	★	●	●	2.3.11
	4	POLE BASE ASSEMBLY (S)	M4-112	★	★	○★	2.3.18
	5	POLE BASE ASSEMBLY (T)	M4-113	★	★	○★	2.3.18
	6	A/C HEAD ASSEMBLY	M4-108	★	●	●	2.3.12
	7	CAPSTAN SHAFT	—	★	★	★	—
	8	PINCH ROLLER ARM ASSEMBLY	M4-107	★	●	●	2.3.6
	9	GUIDE ARM ASSEMBLY	M4-106	★	★	○★	2.3.20
	10	UPPER DRUM ASSEMBLY	M4-6B	★	●	●	2.3.3
	11	DRUM ASSEMBLY	M4-6	★	○	●	2.3.9
Drive system	12	CAPSTAN MOTOR	M4-72		○	●	2.3.8
	13	TENSION BAND ASSEMBLY	M4-89		○	●	2.3.7
	14	CLUTCH UNIT (S)	M4-104		○	△●	2.3.10
	15	CLUTCH UNIT (T)	M4-105		○	△●	2.3.10
	16	BELT	M4-38, 70, 78			●	2.3.13/2.3.14
	17	MAIN BRAKE (S) ASSEMBLY	M4-91			●	2.3.23
	18	MAIN BRAKE (T) ASSEMBLY	M4-93			●	2.3.23
	19	SUB BRAKE (S) ASSEMBLY	M4-92			●	2.3.17
	20	SUB BRAKE (T) ASSEMBLY	M4-94			●	2.3.16
	21	CAPSTAN BRAKE ARM ASSEMBLY	M4-123		●	●	2.3.8
	22	IDLER ARM ASSEMBLY	M4-103			●	2.3.15
	23	REEL DISK (S) (SPACER)	M4-95, 96, 97, 98			△○	2.3.10/16000h replacement
	24	REEL DISK (T)	M4-99, 100, 101			△○	2.3.10/16000h replacement
	25	SLIT DISK (S)	M4-35			△○	2.3.24/16000h replacement
	26	SLIT DISK (T)	M4-36			△○	2.3.24/16000h replacement
	27	WORM GEAR ASSEMBLY	M4-122			○	2.3.27/16000h replacement
	28	CONTROL CAM	M4-51			○	2.3.22/16000h replacement
	29	PULLEY ASSEMBLY	M4-102			○	2.3.26/16000h replacement
	30	CONTROL PALTE	M4-52			○	2.3.10
	31	SLIDE PLATE	M4-65			○	2.3.23
	32	LOADING ARM ASSEMBLY (S)	M4-114			○	2.3.25
	33	LOADING ARM ASSEMBLY (T)	M4-115			○	2.3.25
	34	LOADING MOTOR	M4-118			○	2.3.21
	35	MOTOR PULLEY	M4-119			○	2.3.21
Other	36	BRUSH ASSEMBLY	M4-12		●	●	2.3.4
	37	CLEANER ROLLER ASSEMBLY	M4-8		●	●	2.3.5
	38	ROTARY ENCODER	M4-84			○	2.3.22/16000h replacement
	39	CASSETTE HOUSING ASSEMBLY	M2-52			○	1.1

★: Cleaning ○: Check and replacement if required ●: Replacement △: Lubrication to the shaft

*Notes:

- Maintenance period is calculated assuming that the unit is continuously used in the 12H recording mode. For this reason, maintenance must be performed at a shorter interval than above when the unit is used in an operation condition in which the mode is frequently changed (such as VHS recording mode or Sensor REC mode).
- Read the drum hour meter for an indication of the service life (maintenance interval).

Table 2-2-1 Maintenance & Check Schedule

2.2.3 Cleaning

Periodical cleaning of the tape transport system is desirable. Therefore, perform cleaning when a set is brought in for repairs or maintenance. Contamination of the video heads, tape guides and brush can reduce playback picture quality and in extreme cases, even damage the tape.

- (1) To clean the video heads, press a quality moistened paper gently against the upper drum with fingertip and turn the drum counterclockwise by hand.

Note: Do not stroke it vertically, as this may damage the heads.

- (2) For cleaning of the tape transport mechanism parts other than the upper drum, use a close weave cloth or cotton swab dipped in alcohol.
- (3) After cleaning, be sure to check that the cleaned points are completely dry before loading the video tape.

2.2.4 Lubrication

It is not necessary to periodically lubricate oil or grease, apply lubrication to the new parts only when replacing them. If there is oil or grease at points which come into contact with the replaced parts, wipe it off and lubricate again.

- (1) For the points where oil or grease is to be applied, refer to the mechanism assembly exploded view diagram **M 4**. For oil/grease to be used, refer to Table 2-2-2.

Classification	Name	Part No.	Symbol in Exploded View
Grease	Mal Temp SH-P	VFK1748	AA
Grease	Dry Surf	VFK1749	CC
Grease	Fuloil GB-TS-1	VFK1750	DD
Oil	Cosmo Hydro HV56	VFK1751	BB

Table 2-2-2 Greases and Oil used in the Unit

- (2) Grease is not required for a replacement cassette housing assembly, as this has been applied at the factory.

2.3 REPLACEMENT OF MAIN PARTS

2.3.1 Before removing

This locates the mechanism assembly positions where parts removal and reassembling are performed.

2.3.2 How to set to the mechanism assembly position

Remove the cassette housing assembly (refer to Section 1.1 "DISASSEMBLY OF MAJOR PARTS"), and rotate the mode motor so that the control cam positioning hole comes to the chassis hole on the main deck assembly. In this status, the unit is set at the mechanism assembly position.

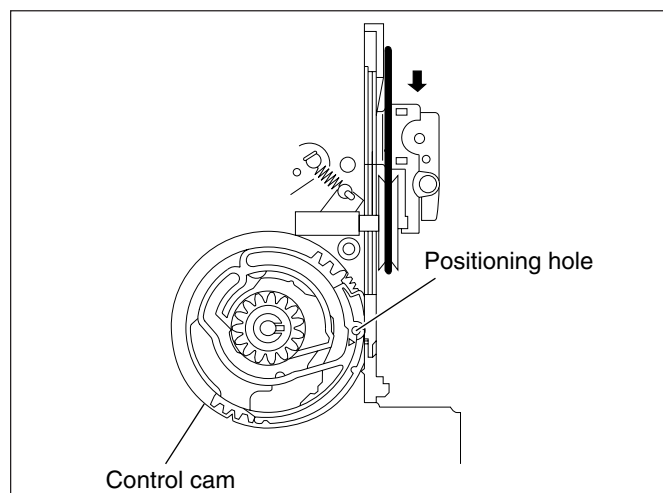


Fig. 2-3-1

2.3.3 Upper drum assembly

① How to remove

- (1) Remove the screw ① and remove the brush assembly.
- (2) Remove the inertia roller and the inertia plate.
- (3) Remove the two screws ② and remove the upper drum assembly.

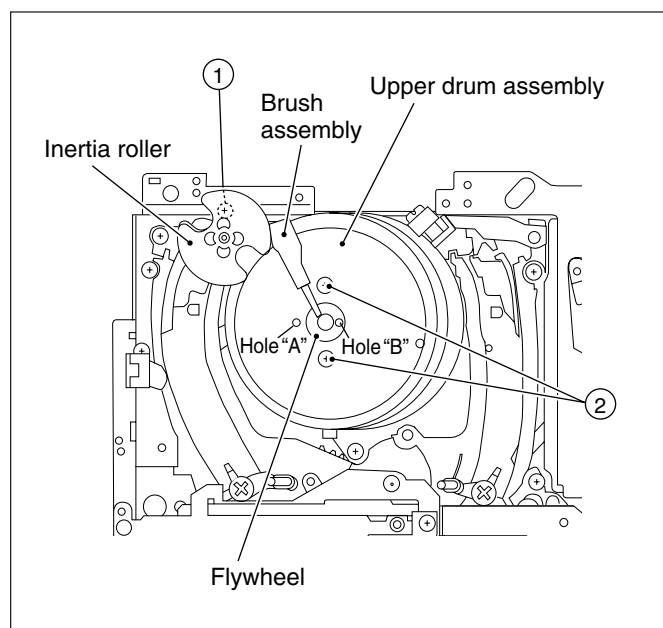


Fig. 2-3-2

② How to reassemble

- (1) Clean the mounting surface of the upper drum assembly and the lower drum assembly.
- (2) Set so that the hole "A" on the upper drum and the hole "B" on the flywheel come to opposite positions with an angle of 180°, and reassemble in the reverse order of removal.
- (3) After replacing the parts, clean the upper drum assembly and the lower drum assembly, and check the following adjustments:
 - Interchangeability adjustment (refer to Section 2.5)
 - Switching point adjustment (refer to Section 3.4.1)
 - V-lock adjustments (refer to Section 3.4.2)
 - Slow tracking preset adjustment (refer to Section 3.4.3)

2.3.4 Brush assembly

- (1) Remove the screw ① to replace the brush assembly. (Refer to Fig. 2-3-2.)

2.3.5 Cleaner roller assembly

- (1) Remove the slit washer.
- (2) Remove the cleaner roller assembly in the direction of the arrow, then attach the new cleaner roller assembly.

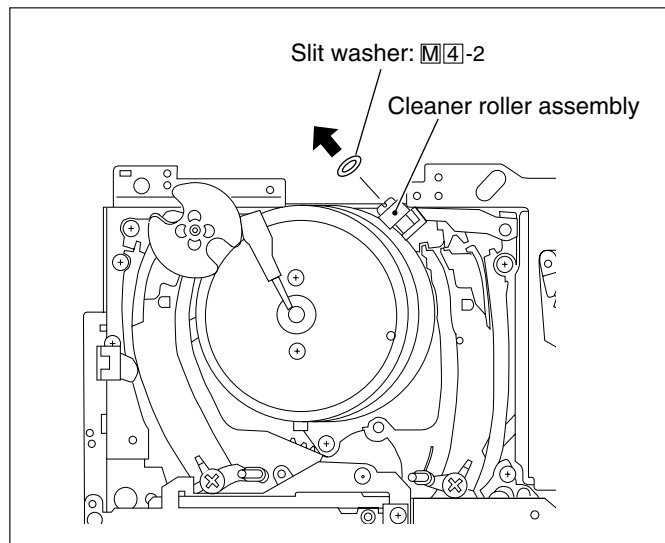


Fig. 2-3-3

2.3.6 Pinch roller arm assembly

① How to remove

- (1) Remove the slit washer.
- (2) While pushing aside the pinch plate in the direction of the arrow, remove the pinch roller arm assembly.

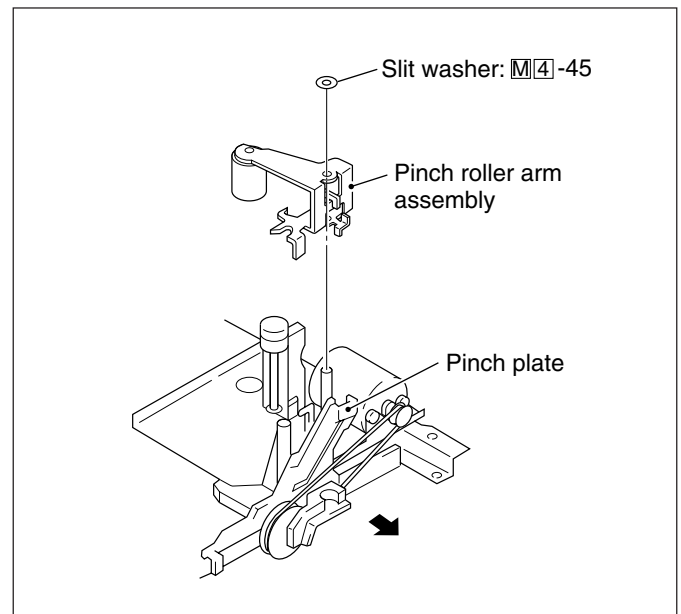


Fig. 2-3-4

② How to reassemble

- (1) Reassemble in the reverse order of removing.

2.3.7 Tension band assembly

① How to remove

- (1) Remove the screw ③.
- (2) While releasing the claws, remove the tension band assembly.

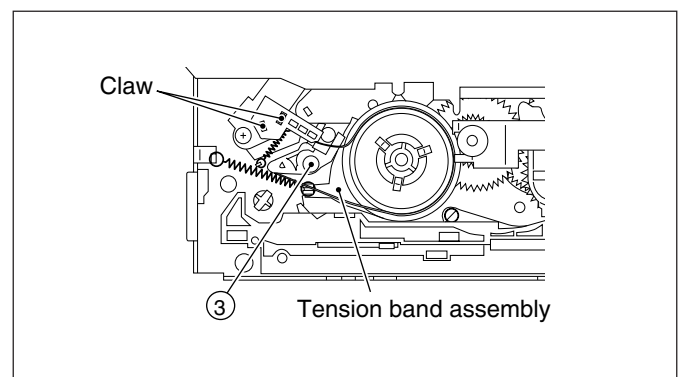


Fig. 2-3-5

② How to reassemble

- (1) Reassemble in the reverse order of removing.
- (2) After reassembling, check the following adjustment:
 - Tension arm position check/adjustment (refer to Section 2.5.4)

2.3.8 Capstan motor, Capstan brake arm assembly

① How to remove

- (1) Remove the mechanism assembly. (Refer to Section 1. 1 "DISASSEMBLY OF MAJOR PARTS".)
- (2) Remove the slit washer and remove the capstan brake arm assembly.
- (3) Remove the screw ⑮ and remove the SENSOR board.
- (4) Remove the belt.
- (5) Remove the three screws ④ and remove the capstan motor from the back of the mechanism assembly.

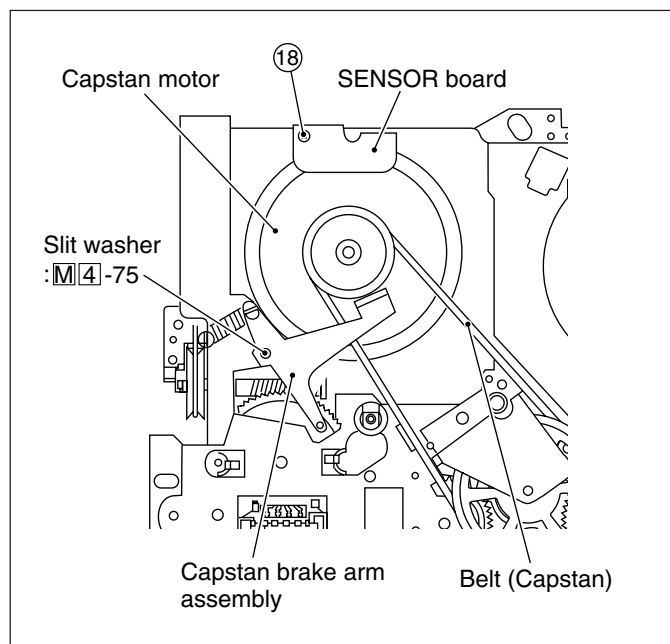


Fig. 2-3-6 (1)

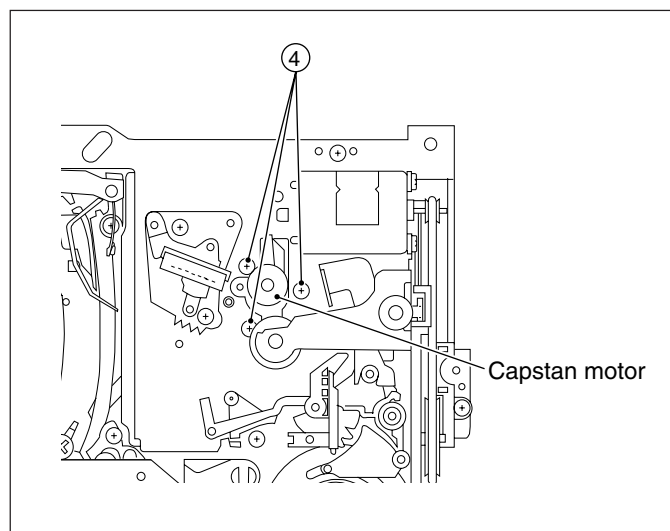


Fig. 2-3-6 (2)

② How to reassemble

- (1) Reassemble in the reverse order of removing.

2.3.9 Drum assembly

① How to remove

- (1) Remove the mechanism assembly. (Refer to Section 1. 1 "DISASSEMBLY OF MAJOR PARTS".)
- (2) Remove the screw ① and remove the brush assembly and inertia roller. (Refer to Fig. 2-3-2.)
- (3) Remove the two screws ⑤ and remove the rotor assembly.
- (4) Remove the three screws ⑥ and remove the stator assembly.
- (5) Be careful the drum assembly drop down, remove the three screws ⑦ and remove the drum assembly.

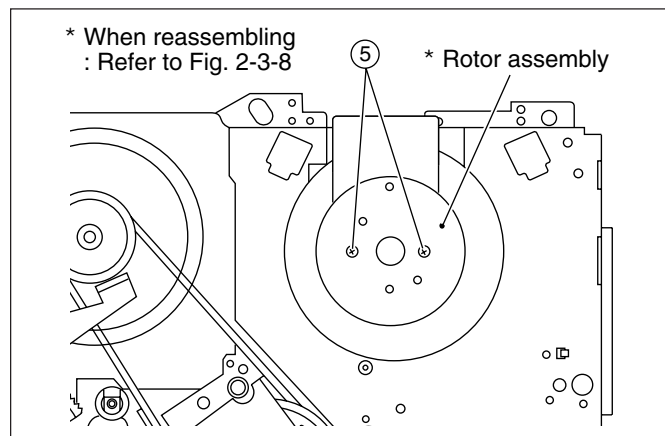


Fig. 2-3-7 (1)

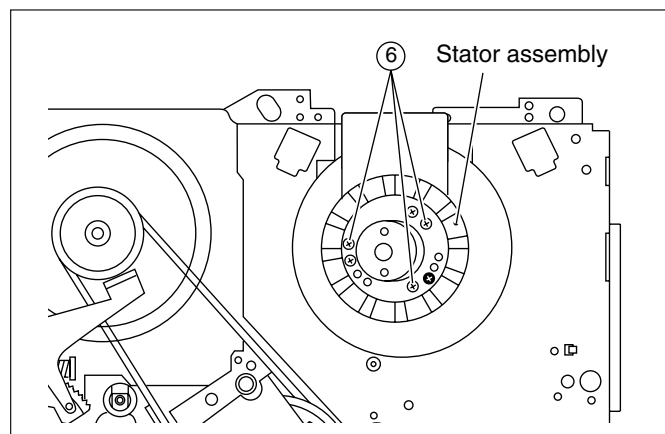


Fig. 2-3-7 (2)

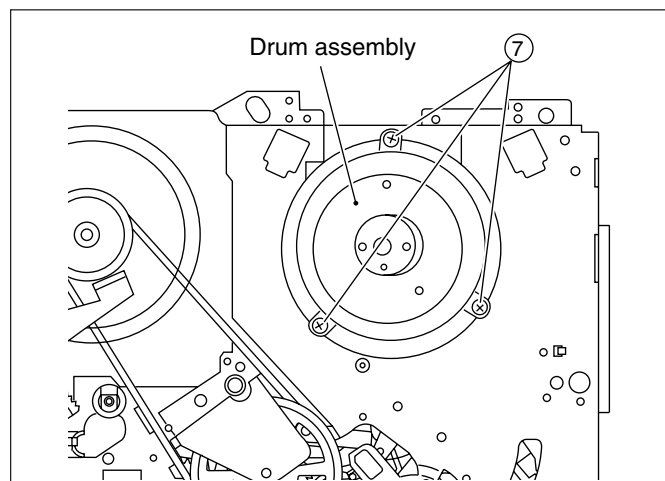


Fig. 2-3-7 (3)

② How to reassemble

- (1) Reassemble in the reverse order of removing.
- (2) After replacing the parts, clean the upper drum assembly and the lower drum assembly, then check the following adjustments:
 - Interchangeability adjustment (refer to Section 2.5)
 - Switching point adjustment (refer to Section 3.4.1)
 - V-lock adjustments (refer to Section 3.4.2)
 - Slow tracking preset adjustment (refer to Section 3.4.3)
 - Skew adjustment (refer to Section 3.4.4)

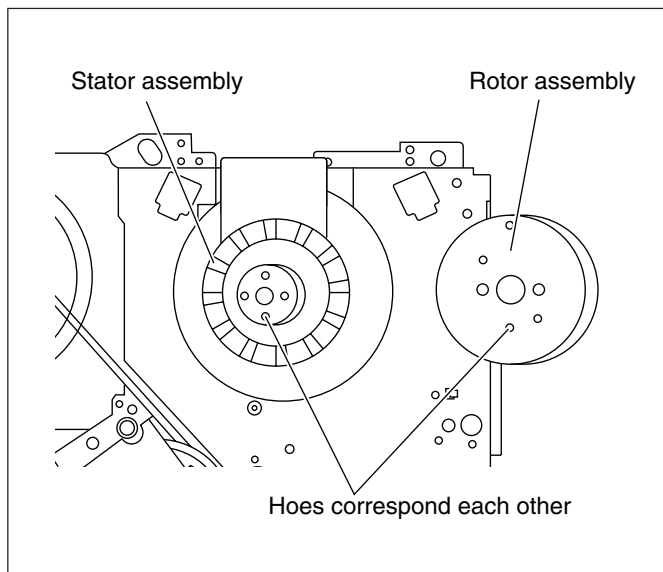


Fig. 2-3-8

2.3.10 Clutch unit (S, T), Control plate, Reel disk (S, T)

① How to remove

- (1) Remove the two slit washers and then remove the reel bracket.

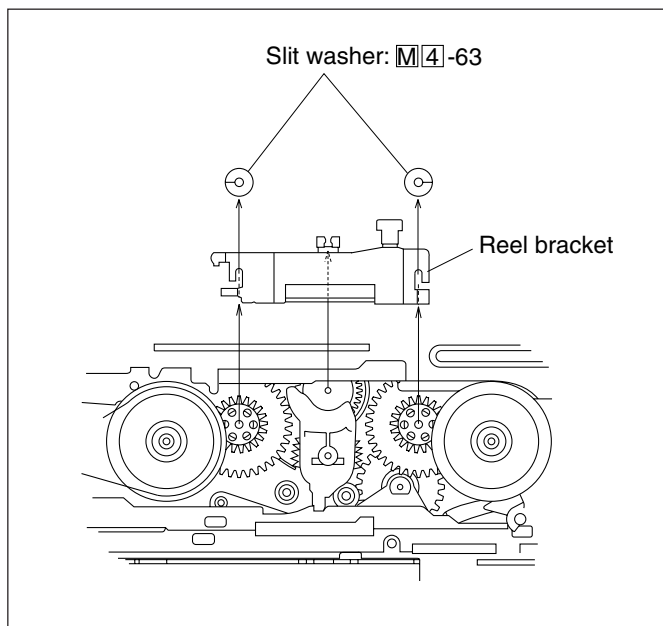


Fig. 2-3-9 (1)

- (2) Release the claw and then release the tension band assembly from the reel disk (S). (Refer to Fig. 2-3-5.)
- (3) Remove the reel disks (S, T).
- (4) Remove the screw ⑧ and remove the control bracket 2.

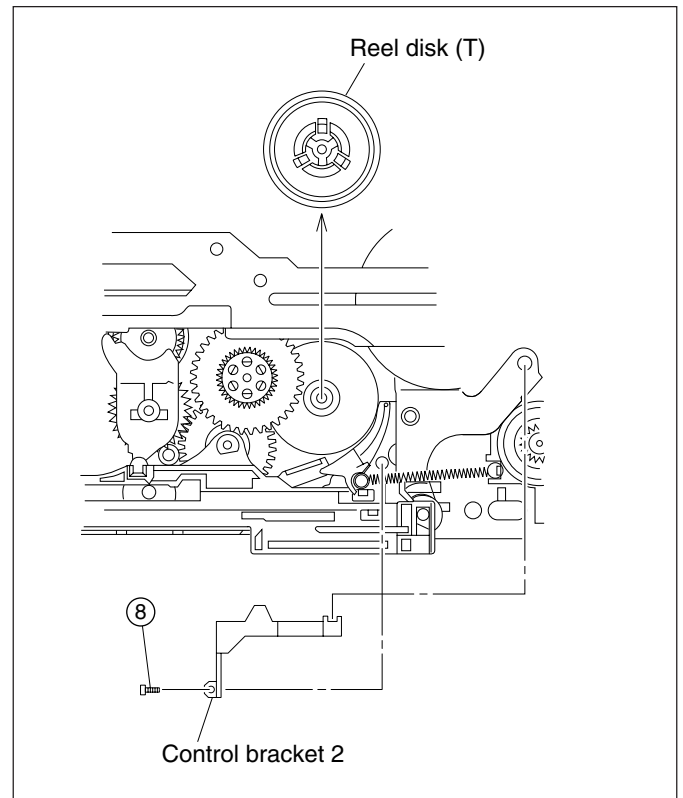


Fig. 2-3-9 (2)

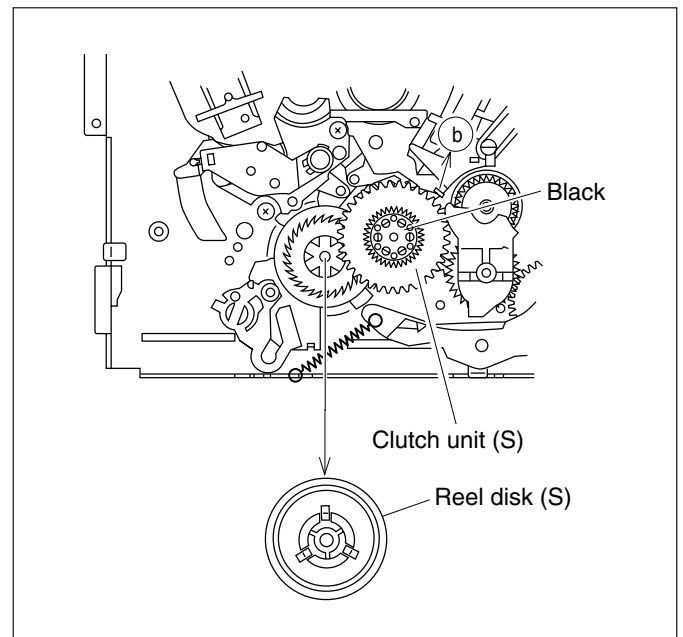


Fig. 2-3-9 (3)

- (5) Remove the screw ⑨ and screw ⑩.
- (6) Remove the earth plate and the control bracket.

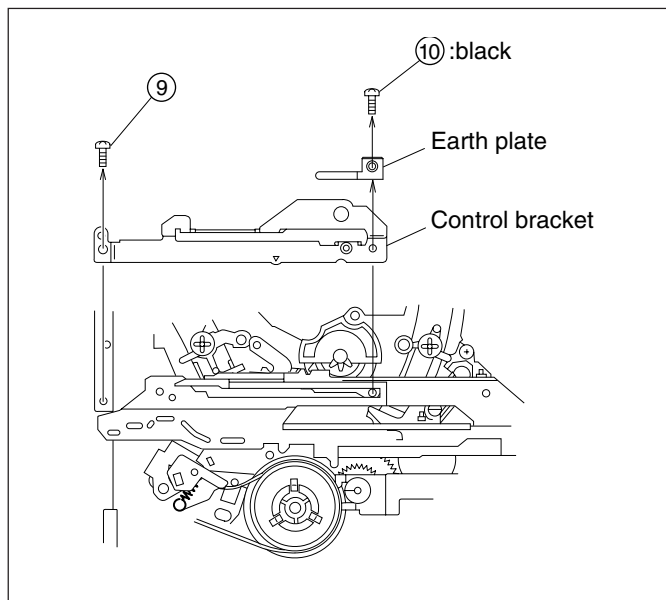
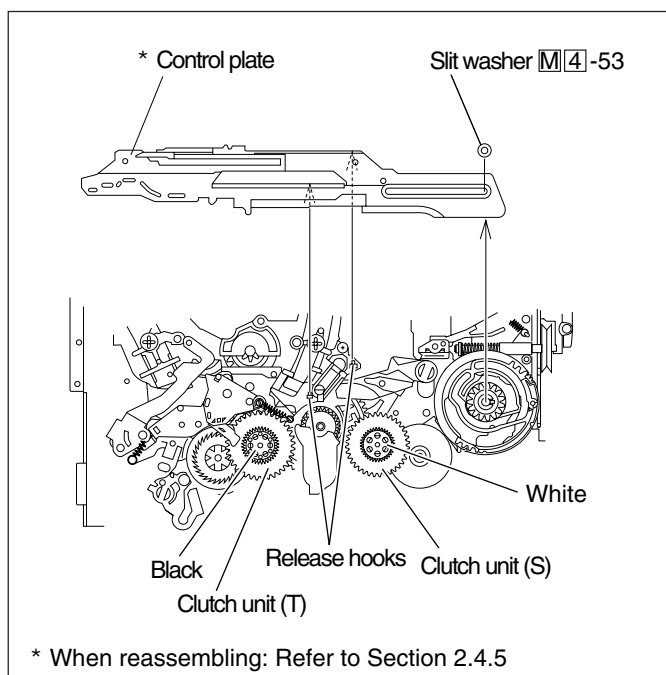


Fig. 2-3-9 (4)

- (7) Remove the slit washer.
- (8) Release the hooks at the two points and remove the control plate.
- (9) Remove the clutch units (S, T).



* When reassembling: Refer to Section 2.4.5

Fig. 2-3-9 (5)

② How to reassemble the reel disk (S.T)

- (1) Reel disk (S)

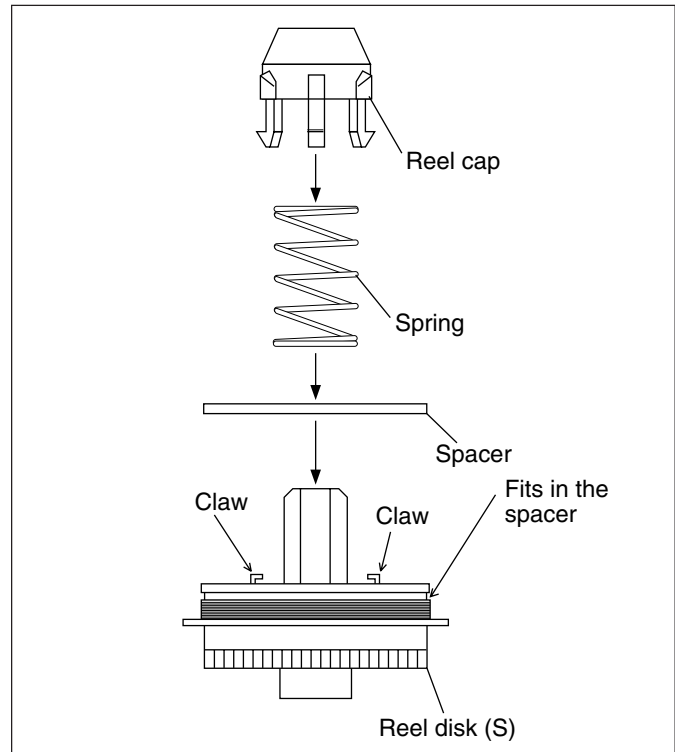


Fig. 2-3-10

- (2) Reel disk (T)

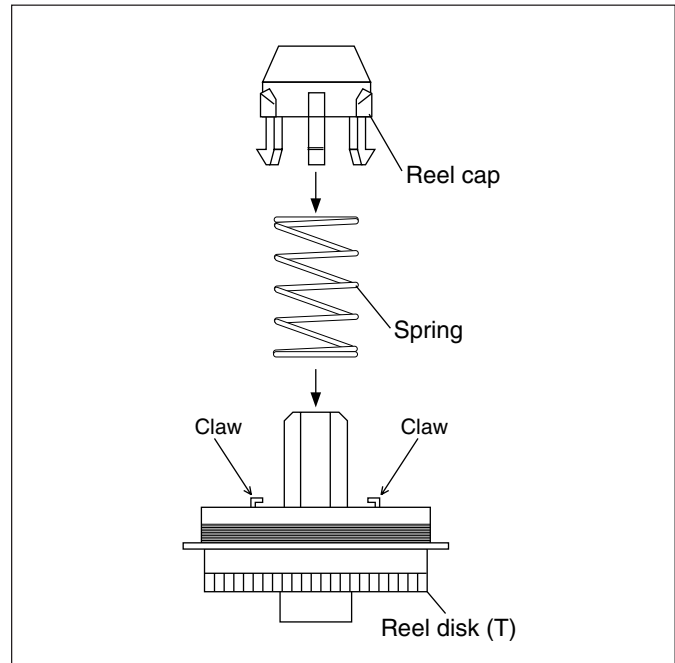


Fig. 2-3-11

③ How to reassemble

- (1) Reassemble in the reverse order of removing.
- (2) When mounting the control plate, set the phase of the control plate appropriately by referring the "How to mount the main parts".
(Refer to Section 2.4.5.)

2.3.11 Full-erase head

- (1) Remove the wire.
- (2) Remove the screw ⑪ and remove the full-erase head for replacement.

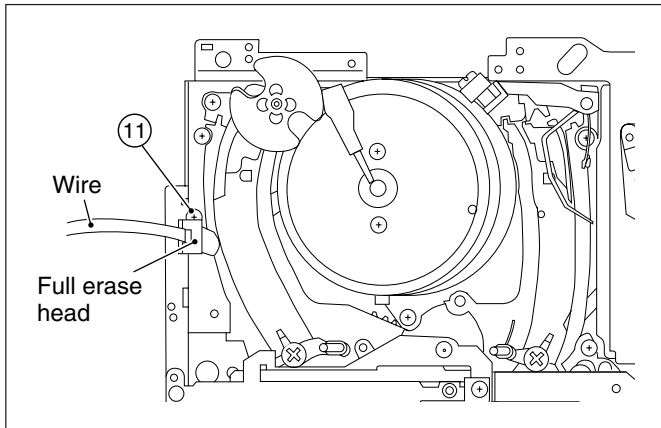


Fig. 2-3-12

2.3.12 A/C head assembly

① How to remove

- (1) Remove the wire.
- (2) Remove the two screws ⑫ and remove the head base.
- (3) Remove the three screws ⑬ and remove the A/C head assembly.

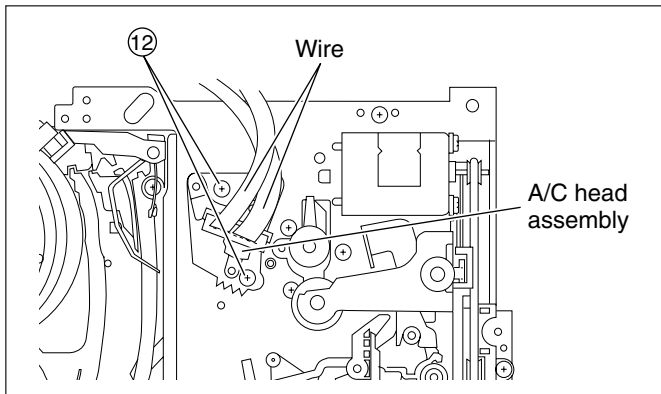


Fig. 2-3-13 (1)

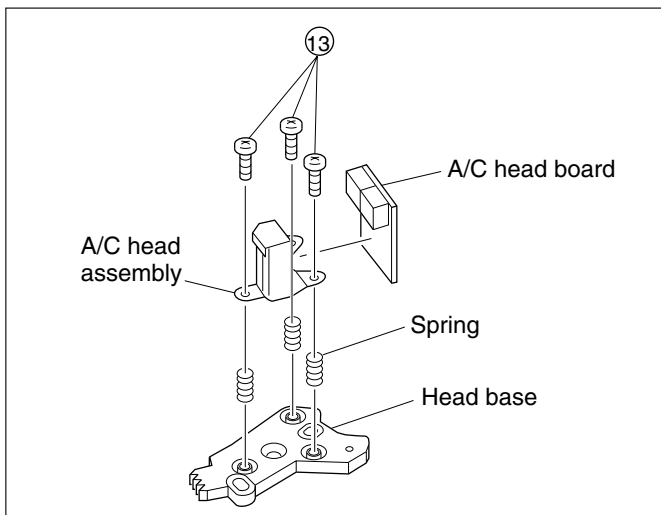


Fig. 2-3-13 (2)

② How to reassemble

- (1) To make the adjustment after reassembling easier, set the mounting height temporarily, then reassemble in the reverse order of removing.

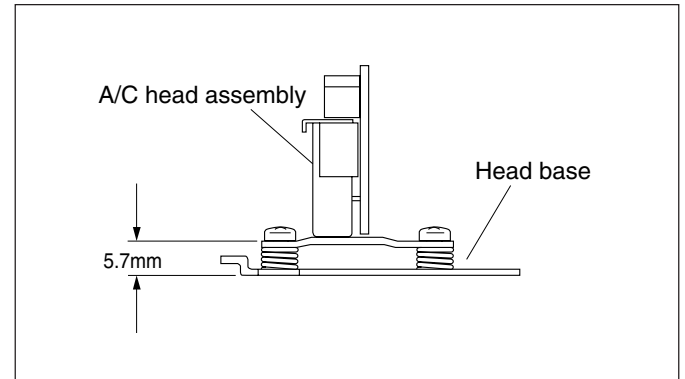


Fig. 2-3-14

- (2) After reassembling, clean the A/C head and perform the following adjustment:

- Interchangeability adjustment (refer to Section 2.5)

2.3.13 Belt (Loading)

- (1) Remove the belt (loading) from the worm gear and motor pulley.

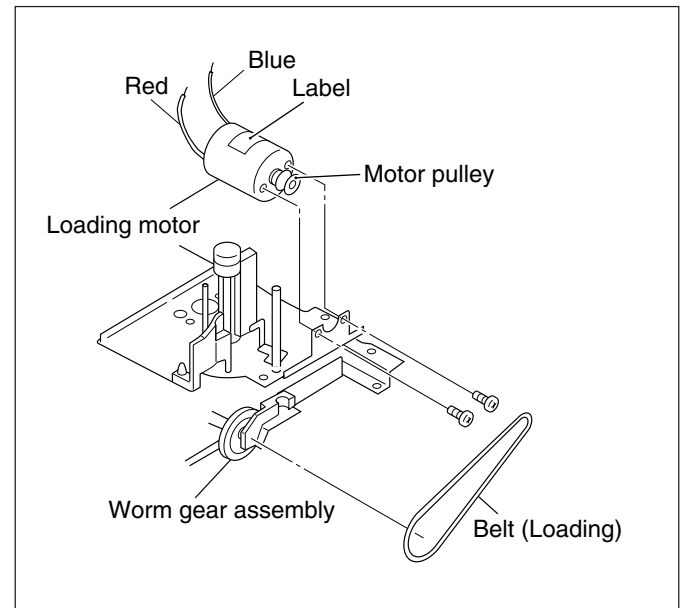


Fig. 2-3-15

2.3.14 Belt (Capstan, Housing)

① How to remove

- (1) Remove the mechanism assembly. (Refer to Section 1. 1 "DISASSEMBLY OF MAJOR PARTS".)
- (2) Remove the belts from the pulleys at each point, and replace them with new ones.

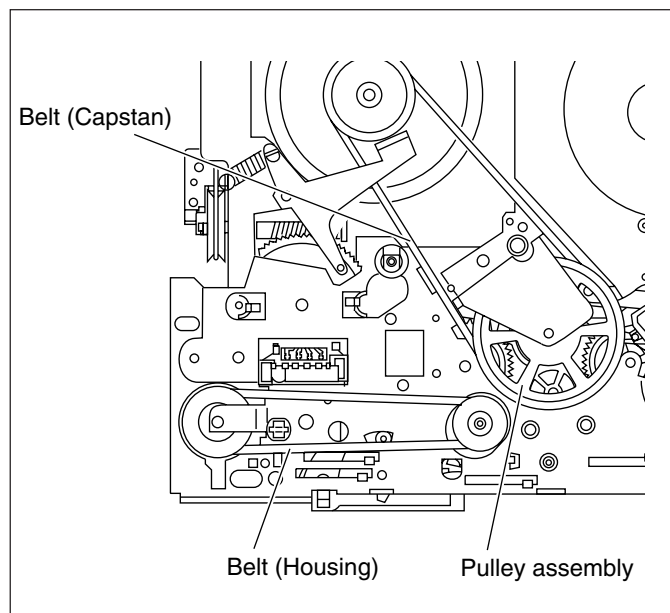


Fig. 2-3-16

2.3.15 Idler assembly

① How to remove

- (1) Remove the two slit washers and remove the reel bracket. (Refer to Fig. 2-3-9(1).)
- (2) Remove the control plate. (Refer to Section 2.3.10.)
- (3) Release the idler lever while push the idler assembly, take out the idler assembly.

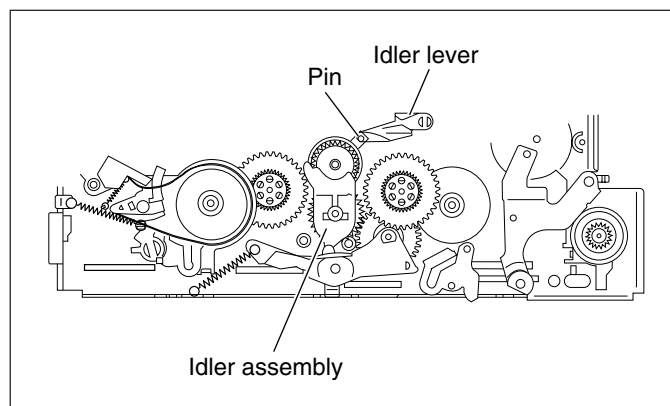


Fig. 2-3-17

② How to reassemble

- (1) Reassemble in the reverse order of removing.

2.3.16 Sub brake assembly (T)

① How to remove

- (1) Remove the two slit washers and then remove the reel bracket. (Refer to Fig. 2-3-9 (1).)
- (2) Take out the reel disk (T). (Refer to Fig. 2-3-9 (2).)
- (3) Remove the spring in the sub-brake assembly, and remove the sub brake assembly by releasing the hook.

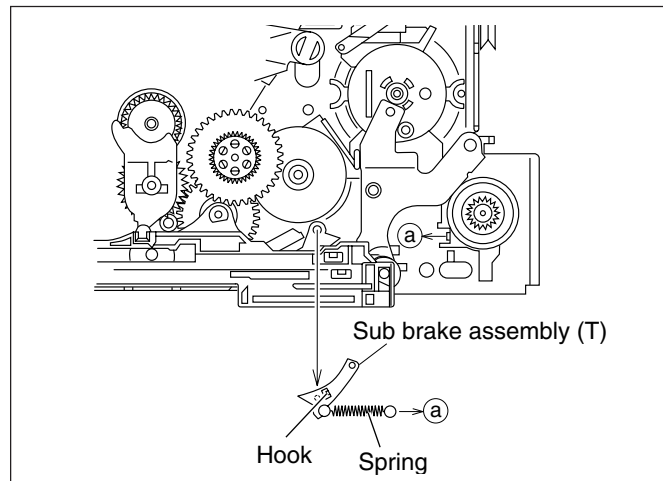


Fig. 2-3-18

② How to reassemble

- (1) Reassemble in the reverse order of removing.

2.3.17 Sub brake assembly (S)

① How to remove

- (1) Remove the two slit washers and remove the reel bracket. (Refer to Fig. 2-3-9 (1).)
- (2) Release the catch and release the tension band assembly from the reel disk (S). (Refer to Fig. 2-3-5.)
- (3) Take out the reel disk (S).
- (4) Remove the spring in the sub brake assembly (S), and take out the sub brake assembly.

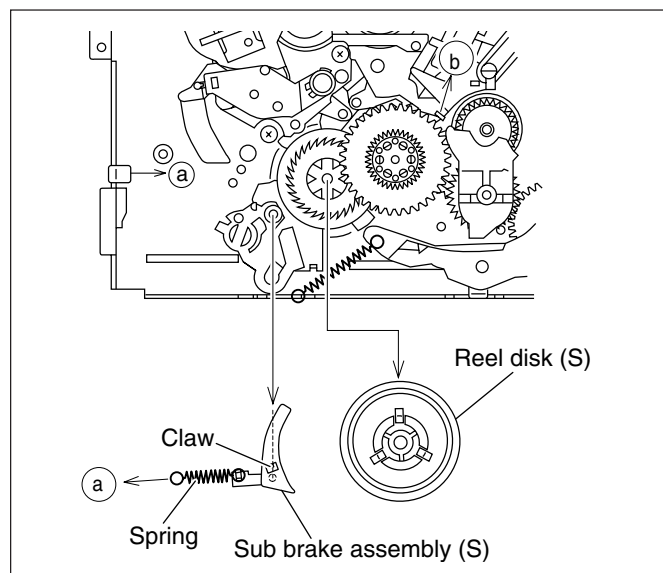


Fig. 2-3-19

② How to reassemble

- (1) Reassemble in the reverse order of removing.

2.3.18 Pole base assembly (S, T)

① How to remove

- (1) Remove the slit washer and take out the release arm and head cleaner arm assembly.
- (2) Remove the two screws (14). (Refer to Fig. 2-3-20 (2).)
- (3) Rotate the loading motor toward you, and shift the pole base assembly to near the loading end position. (Refer to Fig. 2-3-20 (2).)

Note: • If the control plate is removed, shift the pole base assembly by hand.

- (4) While releasing the hook of the pole base assembly from the guide rail and the pin of it from the loading arm, take out the pole base assembly.

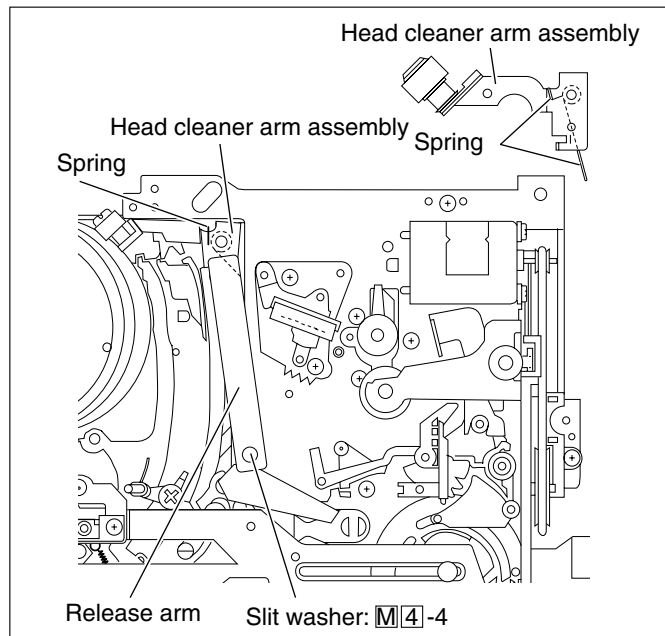


Fig. 2-3-20 (1)

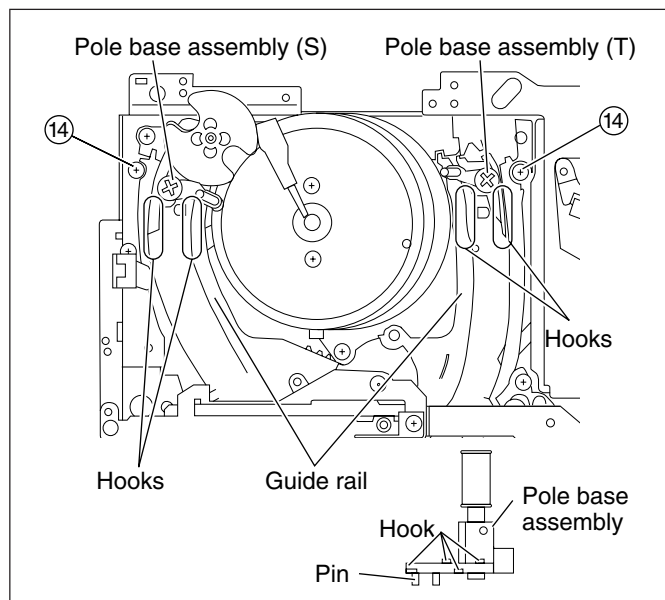


Fig. 2-3-20 (2)

② How to reassemble

- (1) Reassemble in the reverse order of removing.

- (2) After reassembling, clean the pole base assemblies (S, T) and perform the following adjustments:
 - Tape transport check/adjustment (refer to Section 2.5.6)
 - Interchangeability adjustment (refer to Section 2.5)

2.3.19 Guide flange (S, T)

① How to remove

- (1) Remove the two screws (15).
- (2) Take out the guide roller (S, T) and guide flanges (S, T).

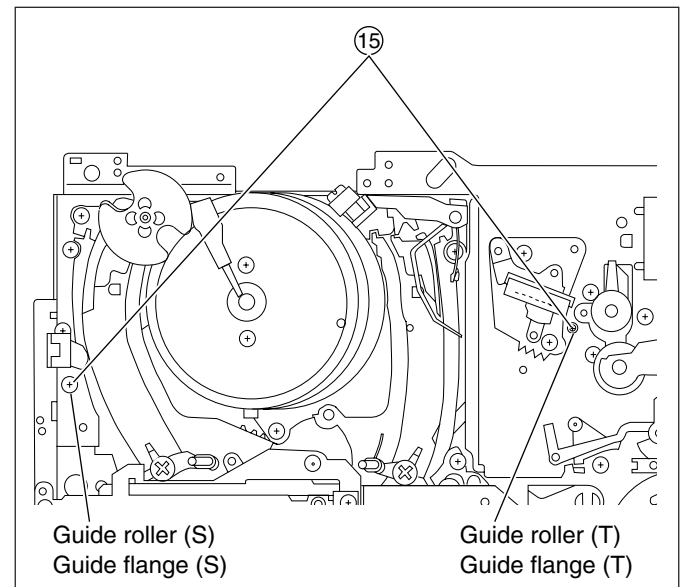


Fig. 2-3-21

② How to reassemble

- (1) Reassemble in the reverse order of removing.
- (2) To make the tape transport adjustment easier after replacement, tighten the screw once until it reaches the end, then rotate it by the following value in the releasing direction to set the temporary height.
 - Guide flange (S)..... 2.5 turns
 - Guide flange (T)..... 1.5 turns

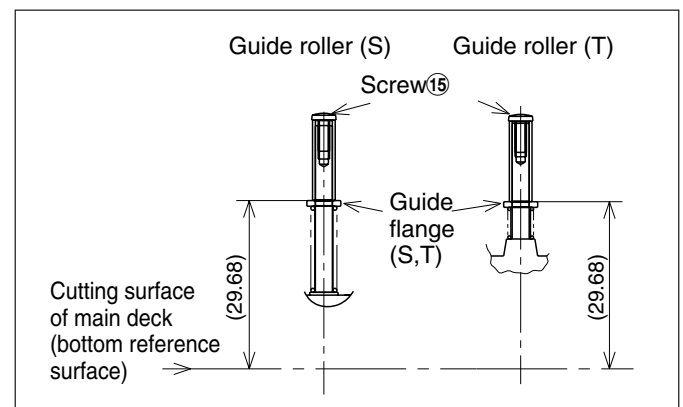


Fig. 2-3-22

- (3) After setting the temporary height, check the following adjustments:
 - Interchangeability adjustment (refer to Section 2.5)

2.3.20 Guide arm assembly

① How to remove

- (1) While releasing the hook remove the lid guide.
- (2) Remove the spring.
- (3) Remove the Guide arm assembly.

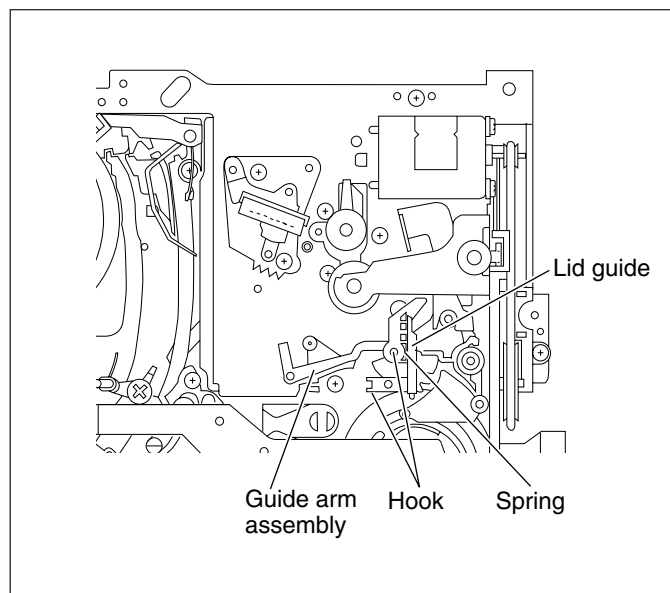


Fig. 2-3-23

② How to reassemble

- (1) Reassemble in the reverse order of removing.
- (2) After replacing the parts, clean the guide arm assembly and check the following adjustments:
 - Interchangeability adjustment (refer to Section 2.5)

2.3.21 Loading motor, Motor pulley

① How to remove

- (1) Remove the belt from the motor pulley.
- (2) Remove the connector CN401 from the P/R board and remove the wire from the loading motor.
- (3) Remove the two screws (16) and remove the loading motor.
- (4) De-solder the wire and remove it from the loading motor.

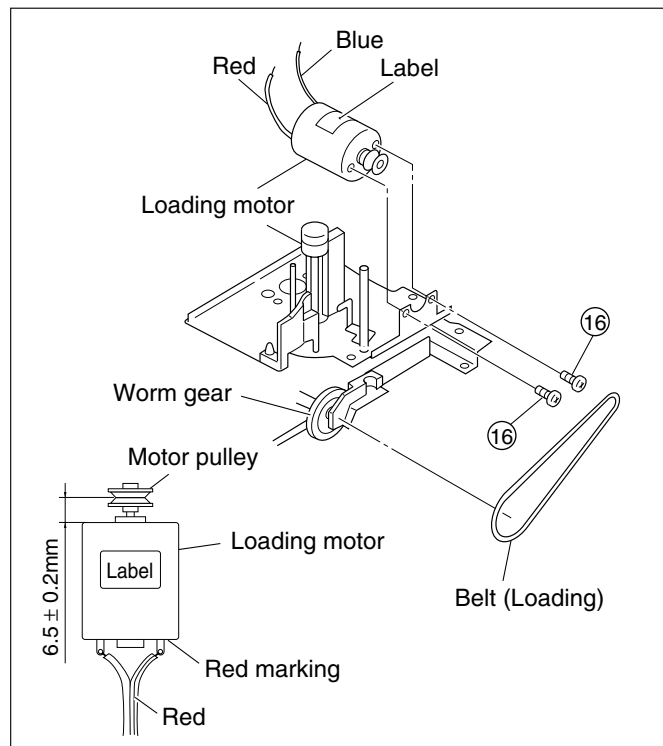


Fig. 2-3-24

② How to reassemble

- (1) Mount the loading motor and motor pulley as shown in Fig. 2-3-24.
- (2) Reassemble in the reverse order of removing.

2.3.22 Rotary encoder, Control cam

① How to remove

- (1) Remove the reek disk (T) and the control plate. (Refer to Section 2.3.11.)
- (2) Remove the slit washer and remove the lever assembly.

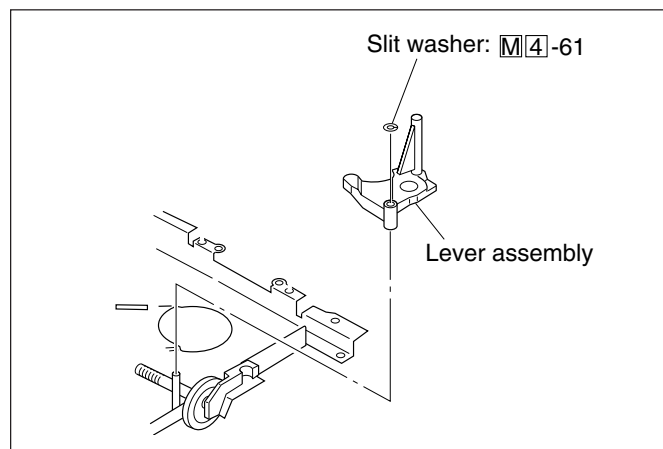


Fig. 2-3-25 (1)

- (3) While releasing the claw of pinch plate, slide it backwards.
- (4) While releasing the claw and rotating the guide arm assembly by clockwise, remove the control cam.

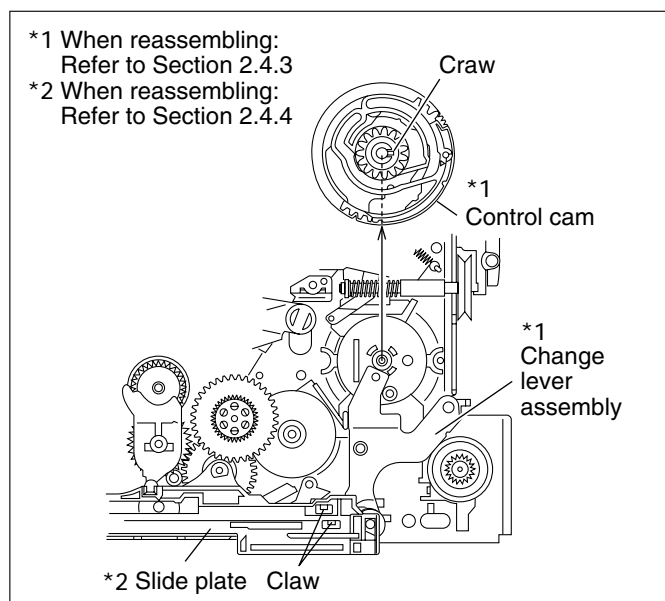


Fig. 2-3-25 (2)

- (4) Remove the slide plate. (Refer to Section 2.3.23.)
- (5) Take out the change lever assembly.
- (6) While releasing the craws at both sides, take out the rotary encoder.

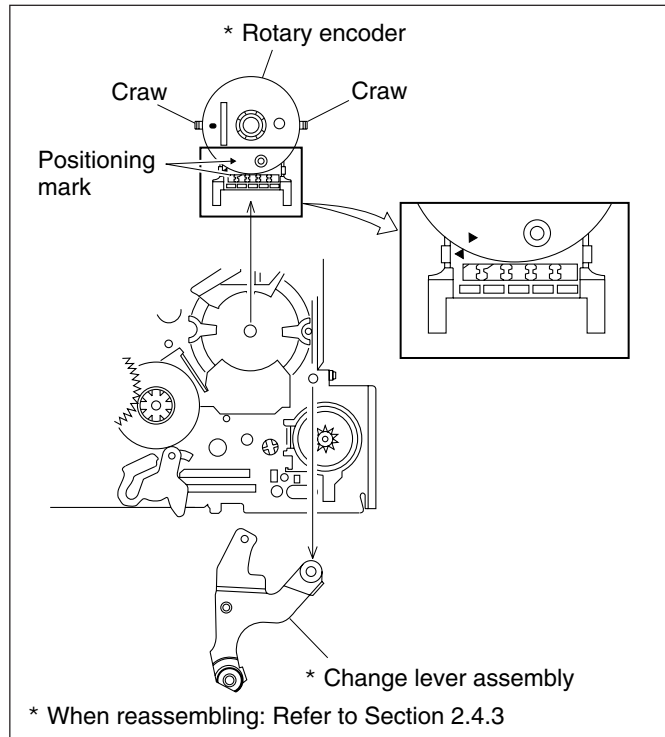


Fig. 2-3-25 (3)

② How to reassemble

- (1) Reassemble in the reverse order of removing.
- (2) When mounting the rotary encoder, control cam or control plate, set the phases of each part appropriately by referring to the "How to mount the main parts". (Refer to Section 2.4.3 and Section 2.4.5.)

2.3.23 Slide plate, Main brake assembly (S, T)

① How to remove

- (1) Remove the mechanism assembly. (Refer to Section 1. 1 "DISASSEMBLY OF MAJOR PARTS".)
- (2) Remove the sub brake assembly (T). (Refer to Section 2.3.16.)
- (3) Remove the sub brake assembly (S). (Refer to Section 2.3.17.)
- (4) Release the seven craws from the back of the mechanism assembly, and take out the slide plate from the front surface of the mechanism assembly.
- (5) Remove the slit disk (S). (Refer to Section 2.3.24.)
- (6) Take out the main brake assembly (T).
- (7) While rotating the main brake assembly, take it out.

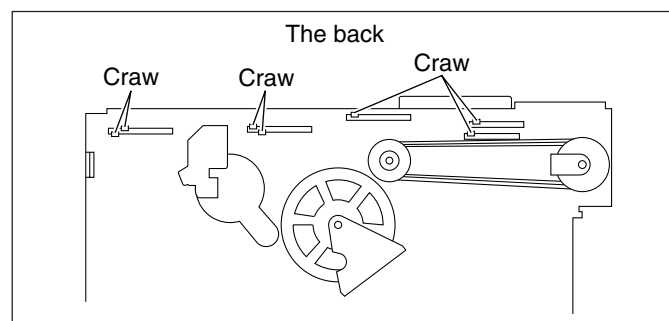


Fig. 2-3-26 (1)

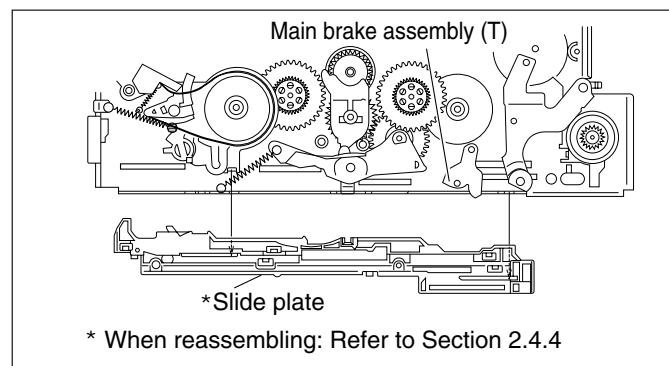


Fig. 2-3-26 (2)

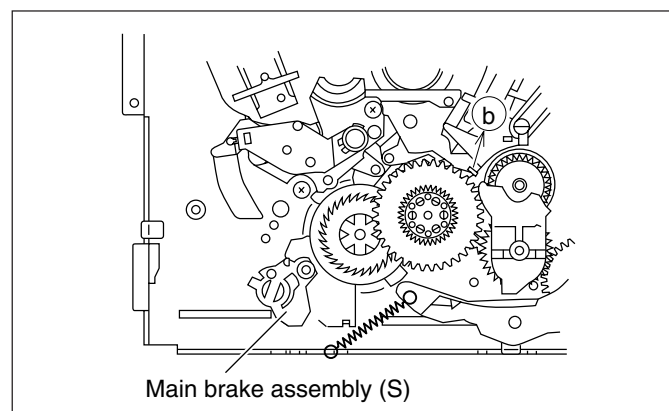


Fig. 2-3-26 (3)

② How to reassemble

- (1) Reassemble in the reverse order of removing.
- (2) When mounting the slide plate, set the phases of each part appropriately by referring the "How to mount the main parts". (Refer to Section 2.4.4.)

2.3.24 Slit disk (S, T)

① How to remove

- (1) Remove the reel disks (S, T), control plate and clutch units (S, T). (Refer to Section 2.3.10.)
- (2) While releasing the take up head and tension arm lever (Refer to Fig. 2-3-28 (2)), take out the slit disks (S, T).

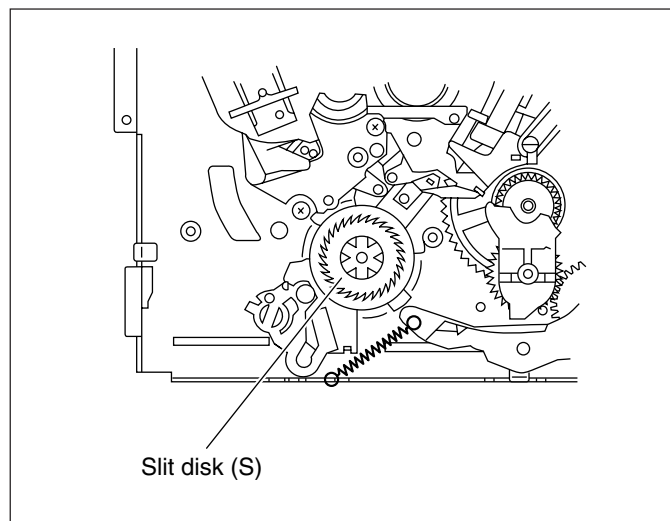


Fig. 2-3-27 (1)

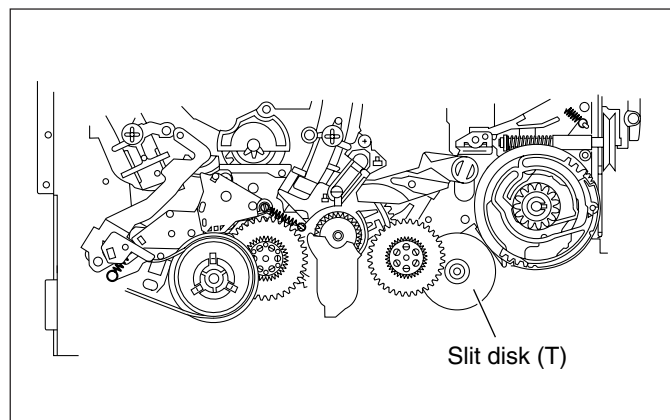


Fig. 2-3-27 (2)

② How to reassemble

- (1) Reassemble in the reverse order of removing.

2.3.25 Guide rail, Loading arm assembly (S, T)

① How to remove

- (1) Remove the brush assembly and inertia roller. (Refer to Section 2.3.3.)
- (2) Remove the reel disk (S), control plate and clutch unit (S). (Refer to Section 2.3.10.)
- (3) Remove the slit washer and remove the tension arm .
- (4) Take out the take-up lever, tension arm lever and take-up head.
- (5) Remove the pole base assembly. (Refer to Section 2.3.18.)

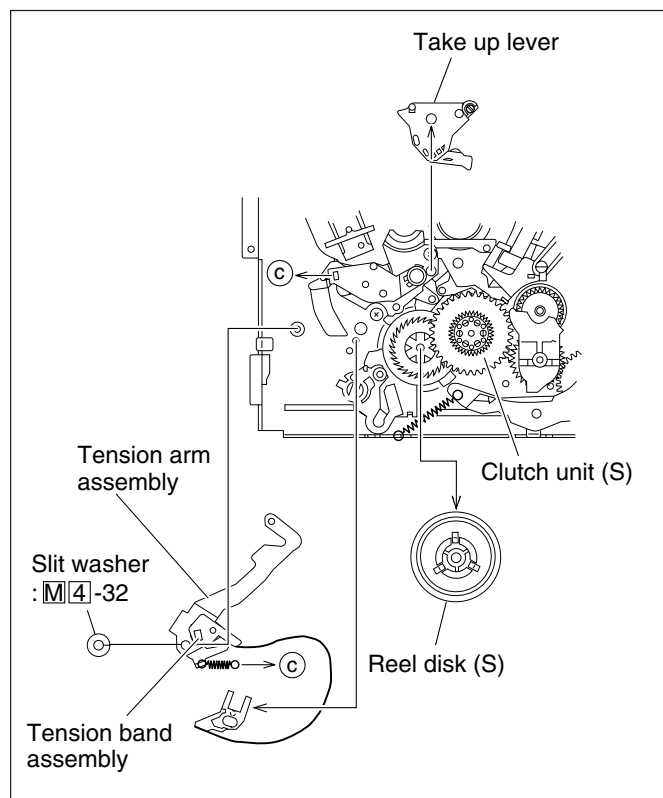


Fig. 2-3-28 (1)

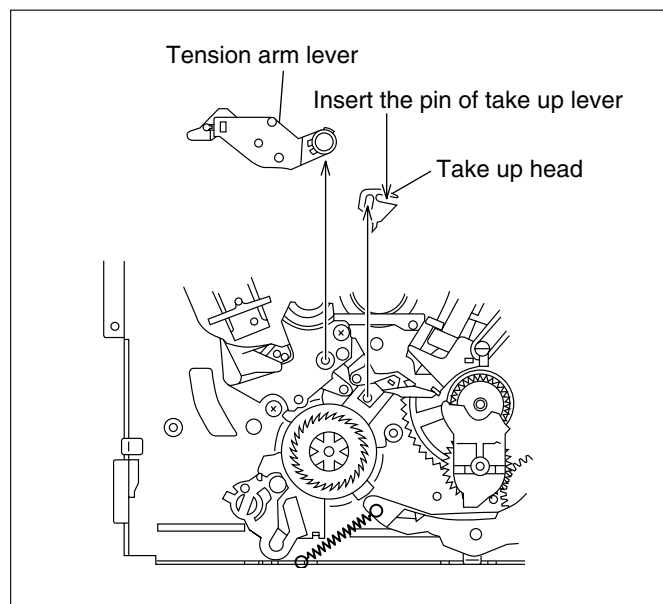


Fig. 2-3-28 (2)

- (6) Remove the five screws ⑰, and remove the guide rail by releasing the claw.
- (7) Take out the loading arm assemblies (S, T).

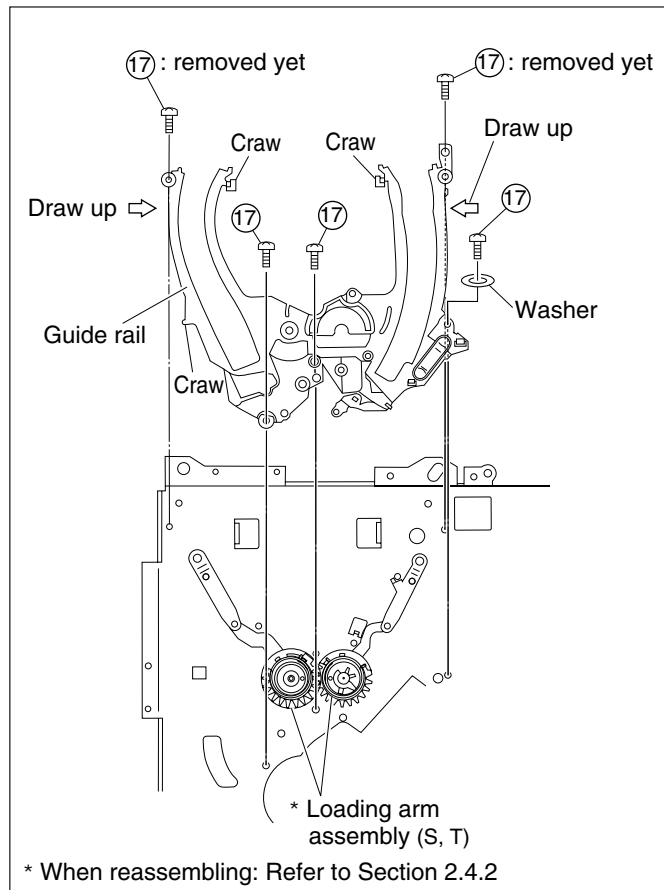


Fig. 2-3-28 (3)

② How to reassemble

- (1) Reassemble in the reverse order of removing.
- (2) When mounting the loading arm assembly and control plate, set the phases of each part appropriately by referring to the "How to mount the main parts". (Refer to Section 2.4.1 and 2.4.5.)
- (3) After replacing the parts, clean the pole base assemblies (S, T), and check the following adjustments:
 - Tape transport system check/adjustment. (Refer to Section 2.5.6.)
 - Interchangeability adjustment. (Refer to Section 2.5.)

2.3.26 Pulley assembly

① How to remove

- (1) Remove the clutch units (S, T), control plate and reel disks (S, T). (Refer to Section 2.3.10.)
- (2) Remove the idler assembly. (Refer to Section 2.3.15.)
- (3) Remove the pole base assembly and guide rail. (Refer to Section 2.3.18 and 2.3.25.)
- (4) Remove the screw ⑰ and remove the idler lever.

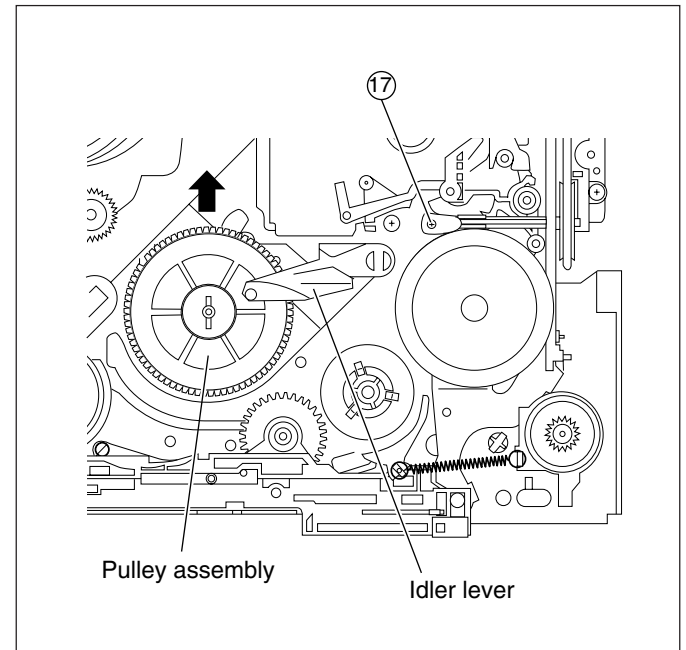


Fig. 2-3-29

- (5) Remove the belt (capstan) from the pulley assembly. (Refer to Fig. 2-3-16.)
- (6) Take out the pulley assembly.

② How to reassemble

- (1) Reassemble in the reverse order of removing.
- (2) When mounting the guide rail and control plate, set the phases of each part appropriately by referring to the "How to mount the main parts". (Refer to Section 2.4.2 and 2.4.5.)

2.3.27 Worm gear assembly

① How to remove

- (1) Remove the control plate. (Refer to Section 2.3.10.)
- (2) Remove the control cam. (Refer to Section 2.3.22.)
- (3) Remove the guide arm assembly. (Refer to Section 2.3.20.)
- (4) Remove the pinch roller arm assembly. (Refer to Section 2.3.6.)
- (5) While releasing the craws, remove the pinch plate.

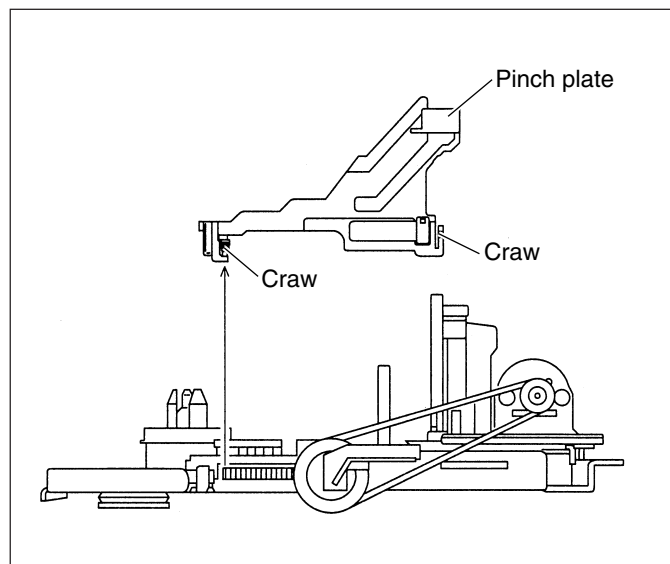


Fig. 2-3-30 (1)

- (6) Remove the worm gear assembly by lifting the right side of the worm gear assembly.

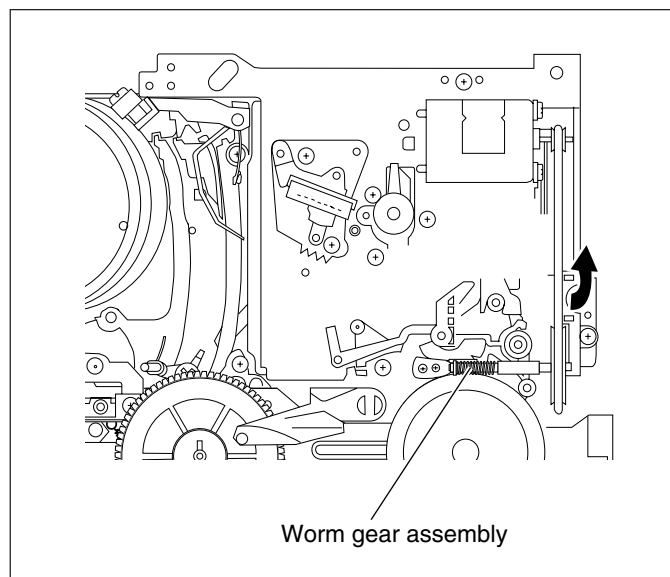


Fig. 2-3-30 (2)

② How to reassemble

- (1) Reassemble in the reverse order of removing.
- (2) When mounting the control plate and control cam, set the phases of each part appropriately by referring to the "How to mount the main parts". (Refer to Section 2.4.3 and 2.4.5.)

2.4 HOW TO MOUNT THE MAIN PARTS (Mechanism Phase Adjustment)

2.4.1 Before parts assembling

The mechanism used in this unit has a close relationship between the rotary encoder and the mechanism control circuit. Therefore, the relationship between the rotary encoder and the control cam determines all the operations of the mechanism parts including the slide plate, loading arm assembly, control plate and brake. If these parts are not mounted at the correct positions, loading/unloading operation will not be performed. Mounting the main parts (mechanism phase adjustment) must be performed at the mechanism assembly position in the same way as in the previous section.

2.4.2 Loading arm assembly (S, T)

- (1) Mount the loading arm assembly (S) and the loading arm assembly (T) so that the positioning marks on both gears come face to face with each other.
- (2) After mounting the guide rail and setting the pole base assembly at the tip of the arm, perform the unloading operation so that the pole base assembly returns to the forefront position.
- (3) Mount the peripheral parts around the guide rail. (Refer to Section 2.3.25.)

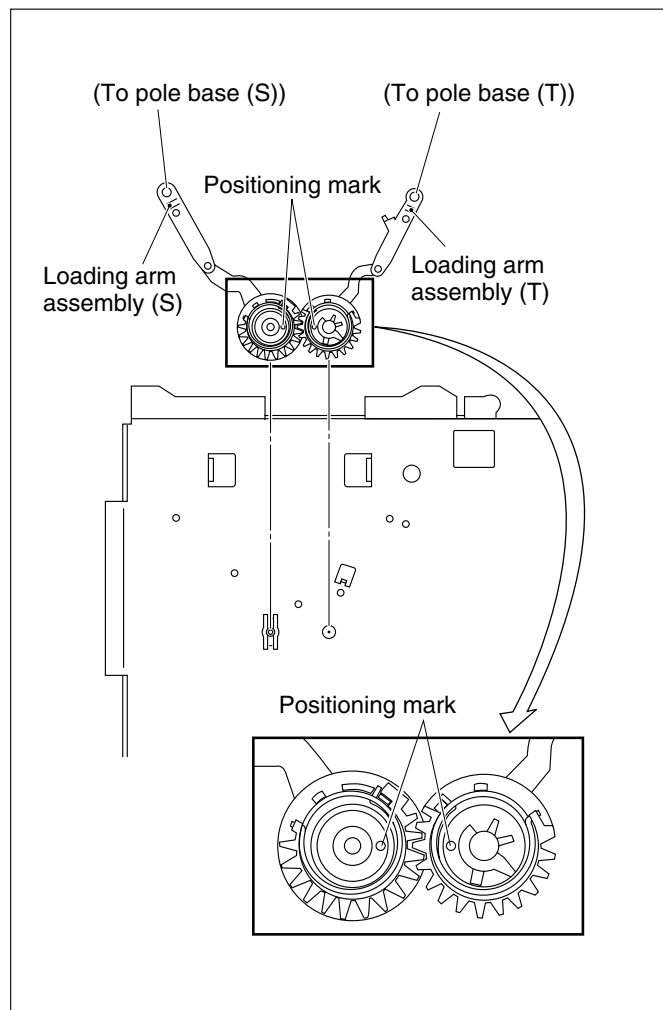


Fig. 2-4-1

2.4.3 Rotary encoder, Change lever, Control cam

- (1) When mounting the rotary encoder, apply the triangular positioning marks of the rotary encoder to those on the mounting shaft, and insert it until the catches are locked.
- (2) When mounting the change lever, set it so that the positioning holes of the change lever are matched with those on the main deck.
- (3) When mounting the control cam, while releasing the capstan brake assembly by the arrow, set it so that the positioning holes of the control cam are matched with those on the main deck.

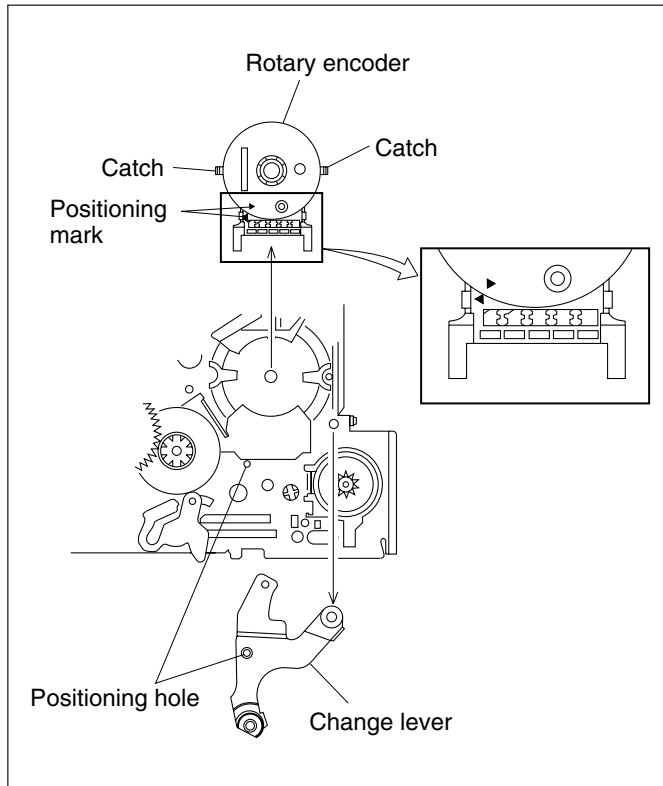


Fig. 2-4-2

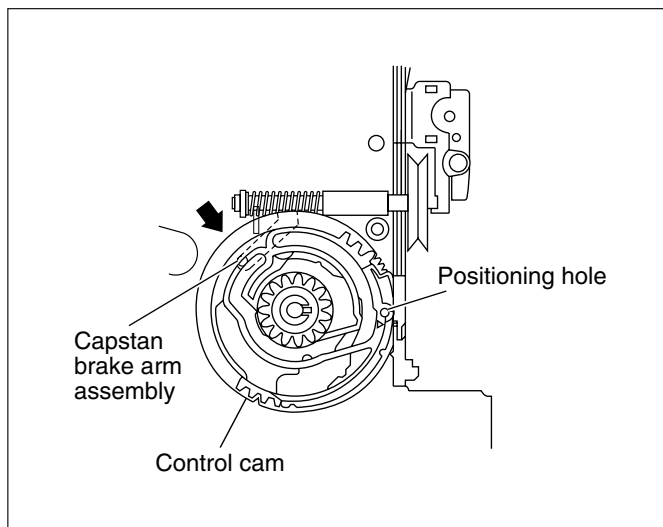


Fig. 2-4-3

2.4.4 Slide plate

- (1) Lower the main brake assemblies (S, T) until they reach to the limit and slide the change arm assembly by the arrow, mount them so that the positioning holes of the slide plate match the holes on the main deck assembly.

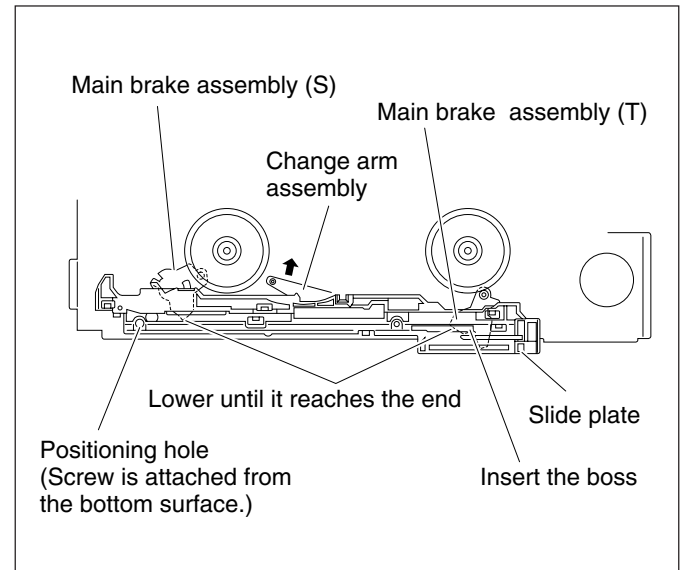


Fig. 2-4-4

2.4.5 Control plate

- (1) Mount the control plate so that the two positioning holes of the control plate match the holes on the main deck assembly and the positioning holes of the take-up lever.
- (2) After mounting the control plate, secure it with the slit washer and the control bracket.

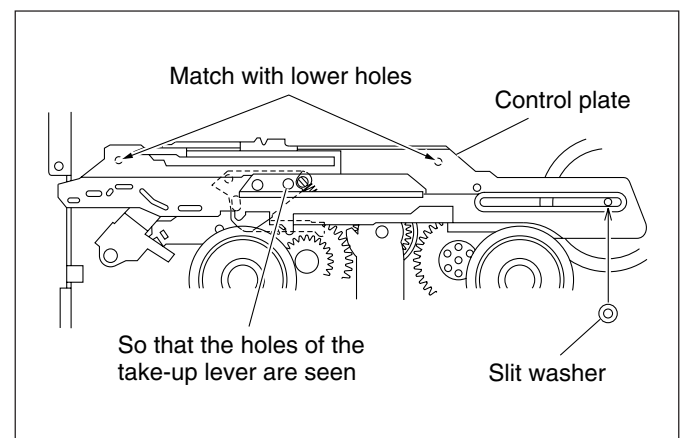


Fig. 2-4-5

2.5 INTERCHANGEABILITY ADJUSTMENT

Notes: • The Interchangeability adjustment is very important. After replacing the A/C head assembly, drum assembly or tape transport parts, the Interchangeability adjustment must be performed.

- In the Interchangeability adjustment, prepare an extra cassette tape (for recording/playback) so as not to damage the alignment tape, and perform the tape running test as a first step. (Refer to Section 2.5.6)
- Set the slope of the oscilloscope to \ominus when playing back the VFK1741 tape.

2.5.1 FM waveform linearity check/adjustment

- (1) Connect the oscilloscope to TP5 (PB FM: 8F) on the P/R board assembly and connect the external sync output to TP4 (D FF: 7F) on the P/R board assembly.
- (2) Play back the alignment tape VFK1741 to observe the FM waveform.
- (3) During playback, press the tracking buttons (+, -) simultaneously to enter the tracking center position.
- (4) By adjusting the tracking, check that there is no apparent level drop in the FM waveform and that the waveform varies totally in parallel and with linearity. If required, perform the following adjustments. (Fig. 2-5-1)
- (5) Using the hexagonal wrench (1.25 mm), lightly release the set screw at the bottom of the pole base assembly. (Pay attention not to release too much.) (Fig. 2-5-2)
- (6) During playback, press the tracking button (+, -) to reduce the FM waveform. If a drop in level is observed at the left-hand side as shown in Fig. 2-5-3, adjust the guide roller on the pole base assembly (S) using the roller driver so that a linear FM waveform is obtained. If a drop in level is observed at the right-hand side, rotate the guide roller on the pole base assembly (T) for adjustment. (Fig. 2-5-3)
- (7) After adjusting, tighten the set screw at the bottom of the pole base assembly. (Pay attention not to tighten excessively.)
- (8) After tightening the set screw, play back the alignment tape VFK1741 to check the FM waveform varies as shown in the optimum waveform changing examples.
- (9) When the alignment tape VFK1741 is played back after being ejected and reloaded or soon after the search reverse mode is operated, check that the FM waveform stabilizes within 2 sec. of appearing. If it takes more than 2 sec., check which side (right or left) of the FM waveform is unstable and check the following items.
 - A drop in level is observed at the left-hand side:
Check the guide roller (S) of the Pole base assembly
 - A drop in level is observed at the right-hand side:
Check the guide roller (T) of the Pole base assembly, the height of the guide arm assembly, and the tilt of A/C head
- (10) Perform the tape transport system check. (Refer to Section 2.5.6.)

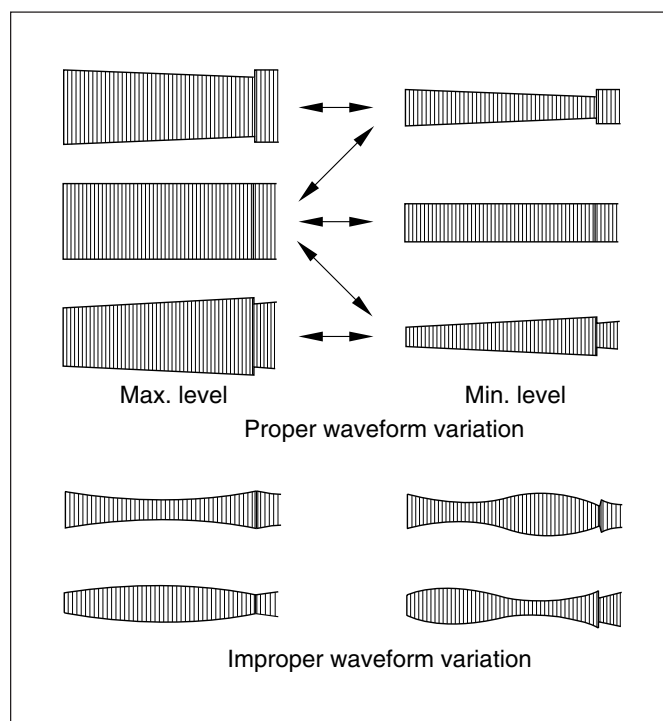


Fig. 2-5-1

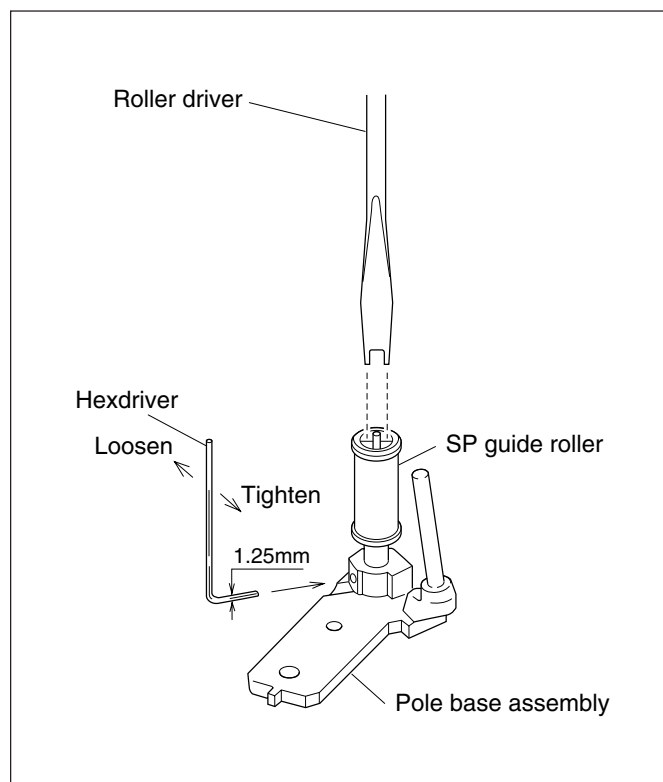


Fig. 2-5-2

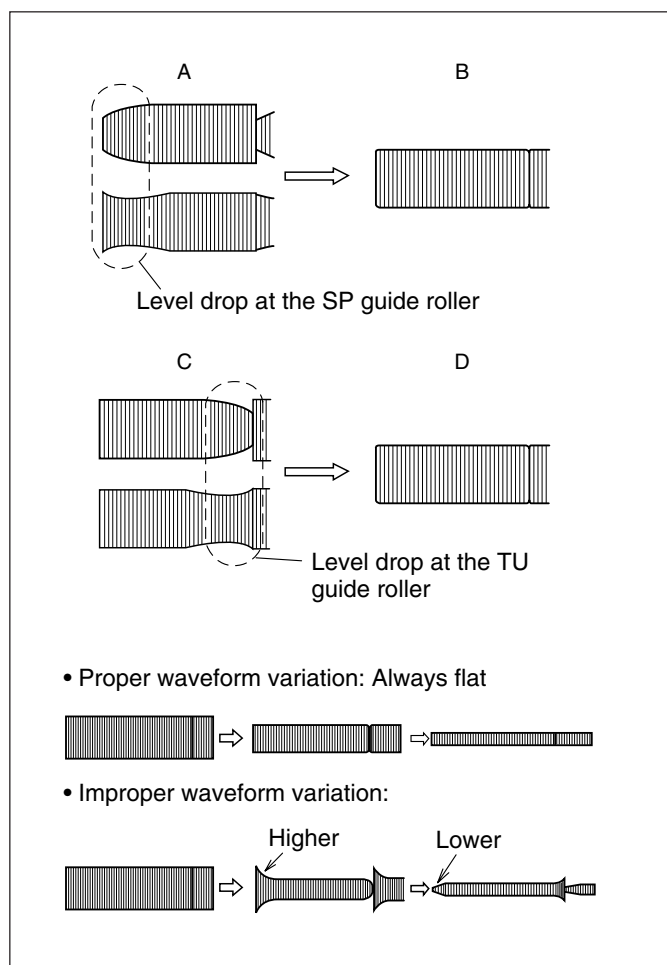


Fig. 2-5-3

2.5.2 A/C head assembly height, Azimuth check/adjustment

Note: • To make adjustment easier, set the A/C head assembly to a temporary height before hand. (Refer to Fig. 2-3-14.)

- Tilt (forward bent) adjustment
 - (1) Adjust the screw ① with the parallel check plate so that the tilt of the A/C head assembly is 0.05 mm.
 - (2) Confirm that tape is neither damaged nor wrinkled around the lower flange of the guide roller (T). If tape is wrinkled, fine adjust the height of the guide roller (T). (Refer to Section 2.5.6.)
- Height and azimuth adjustment
 - (1) Connect the CH-1 of the oscilloscope to Audio Out terminal and connect the CH-2 to TP624 (CTL: 6Q) on the main PC board, then observe the waveform at both channels with ALT mode.
 - (2) Play back the VFK1741 alignment tape, and adjust the waveform of Audio Out and control pulse are maximum values by rotating the screws ①, ② and ③ small and equal increments. <Height adjustment>
 - (3) Then rotate the screw ② to adjust so that both the audio and control pulse waveforms become maximum. <Azimuth adjustment>

- (4) Repeat the above steps No. (2) and No. (3) alternately for more precise adjustment.
- (5) Confirm that the tilt of the A/C head assembly is 0.05 mm with the parallel check plate. If it is out of specification, repeat all the steps of this section.
- (6) Perform the tape transport system check. (Refer to Section 2.5.6.)

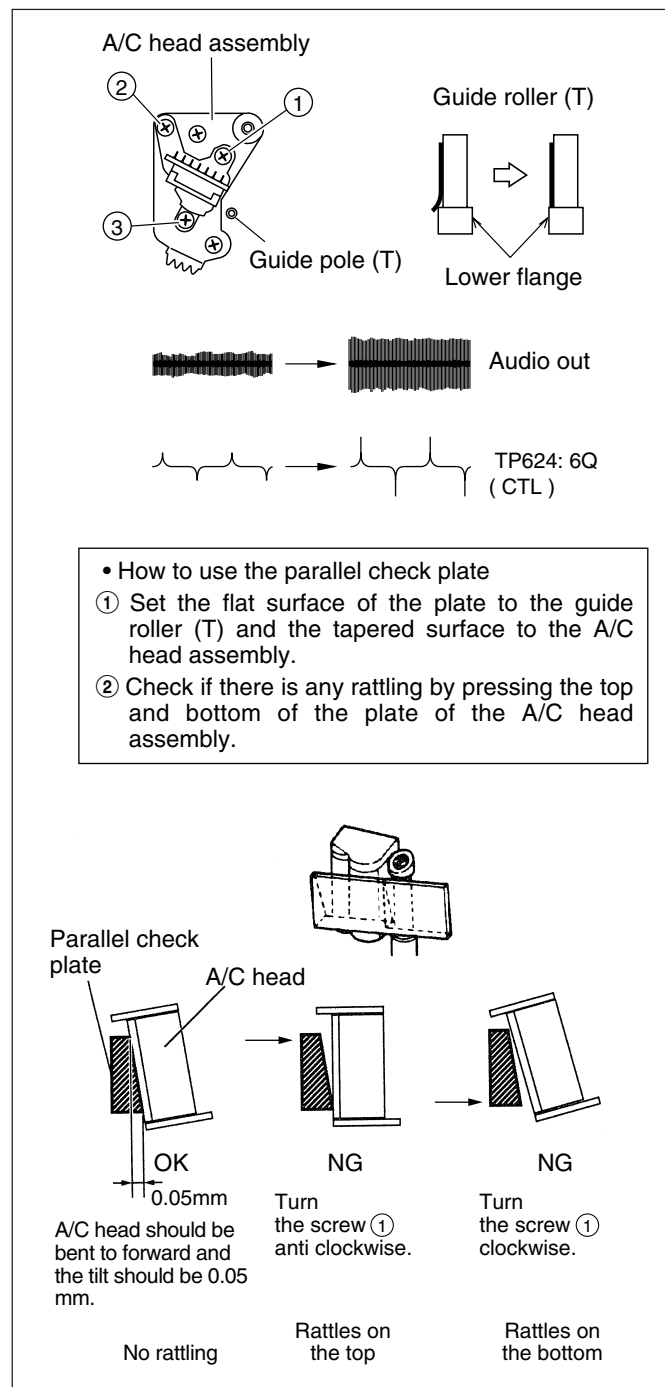


Fig. 2-5-4

2.5.3 A/C (Audio Control) head phase (X value) check/adjustment

- (1) Connect the oscilloscope to TP5 (PB FM:8F) on the P/R board and Audio Out terminal, and connect the external sync to TP4 (D FF:7F) on the P/R board.
- (2) Play back the alignment tape VFK1742 to observe the FM waveform and audio signal.
- (3) During playback, press the tracking buttons (+, -) simultaneously to enter the tracking center position.
- (4) Loosen the screws ④ and ⑤ and set the A/C head position bit as shown in Fig. 2-5-5.
- (5) Rotate the A/C head position bit to adjust the A/C head position so that the FM waveform becomes maximum and the "no-recorded" portion between the FM waveform and the audio signal is within 3 fields.
- (6) Play back the alignment tape VFK1741 and observe FM waveform.
- (7) During playback, press the tracking buttons (+, -) simultaneously to enter the tracking center position.
- (8) By adjusting the tracking, check that the FM waveform becomes maximum at the tracking center position.
(The FM level at the tracking center position should be -1 dB or more against the maximum FM level.)
- (9) If the maximum waveform is not obtained, rotate the A/C head position bit to adjust the audio control head position so that the maximum FM waveform is observed first time.

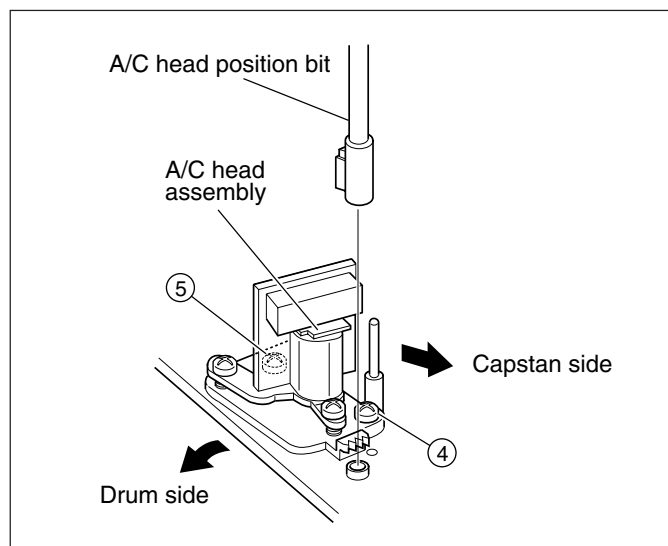
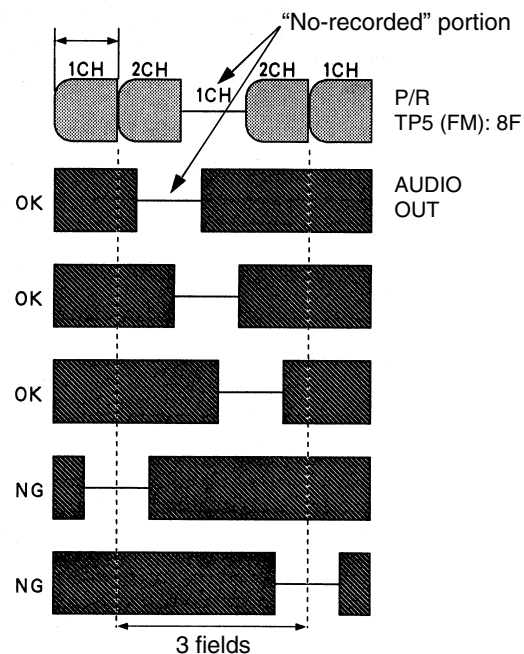


Fig. 2-5-5

- (10) Repeat the above step (6) – (9) to meet specifications of step (8).
- (11) Tighten the screws ④ and ⑤.
- (12) Confirm the azimuth of the A/C head. (Refer to Section 2.5.2.)

The FM waveform becomes maximum and the "no-recorded" portion between the FM waveform and the audio signal is within 3 fields.



• Manner of external synchronization:

- ① Set the oscilloscope's time sweep to 10 msec.
- ② In the condition that the oscilloscope is synchronized with D.F.F signal, turn the oscilloscope's HOLD OFF control in the direction of (+) to stabilize non-recorded portion.

Fig. 2-5-6

Note: How to convert dB value

When set the maximum FM level to 5.0 scale divisions on the oscilloscope,
more than -1dB: more than 4.5 scale divisions

2.5.4 Tension arm position check/adjustment

① Temporary adjustment of mounting position

- (1) Rotate the loading motor manually to set to the loading-end position.
- (2) Check that the tip of the tension arm comes to the hole "A" on the main deck.
- (3) If the tip of the tension arm does not come to the above step (2), loosen the screw ⑥ slightly and rotate the adjustment pin.

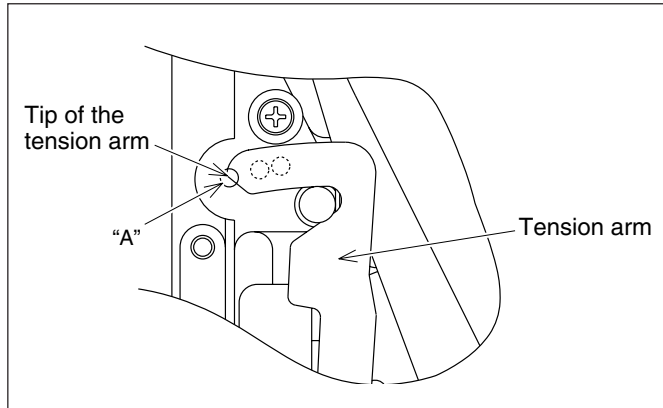


Fig. 2-5-7 (1)

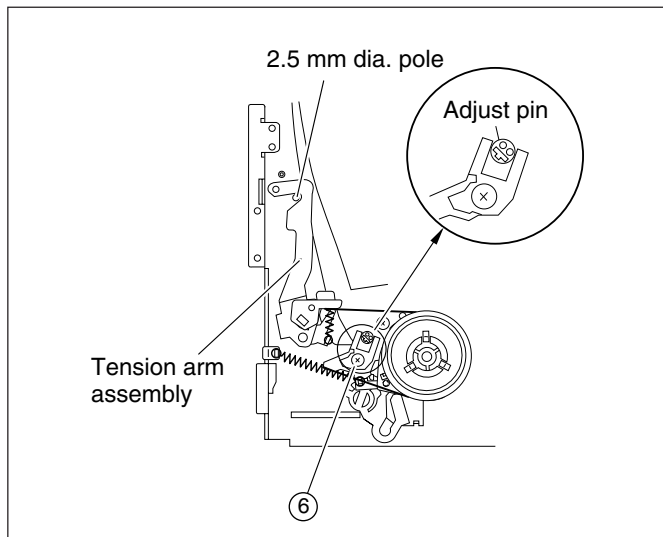


Fig. 2-5-7 (2)

② Back torque check/adjustment

- (1) Play back the cassette torque meter, and check that the torque value at the supply (left) side is $4.41 \pm 0.39 \times 10^{-3}$ N·m (indication value: 45 ± 4 gf·cm).
- (2) If the indication is not of the above value, perform adjustments in the following manner:
 - 1) Remove the cassette torque meter.
 - 2) Loosen the screw ⑥ slightly and rotate the adjustment pin.
(Turn the adjustment pin clockwise to increase the torque, and counterclockwise to decrease it.)
 - 3) Check the above step (1) again, and repeat the adjustments until the specified value is obtained.
 - 4) Perform the tape transport system check.

2.5.5 Take-up torque check

- (1) Play back the cassette torque meter, and check that the torque value at the take-up (right) side is $7.35 \pm 2.94 \times 10^{-3}$ N·m (indication value: 75 ± 30 g·cm).
- (2) If not meet the specification, replace the clutch unit (T) and confirm this section again.

2.5.6 Tape transport system check/adjustment

Note: • When the tape transport mechanism parts shown in the figure below are removed or replaced, the tape transport system check/adjustment must be performed.

① Tape transport system check

- (1) Play back the thin-type tape (E-240).
- (2) Change the playback mode in the following order:
PLAY → SEARCH REV → SEARCH FWD → PLAY
- (3) Check that creasing or damage to the tape does not occur at the SP/TU guide rollers (pole base assembly), guide rollers (S, T) or at the guide arm assembly.

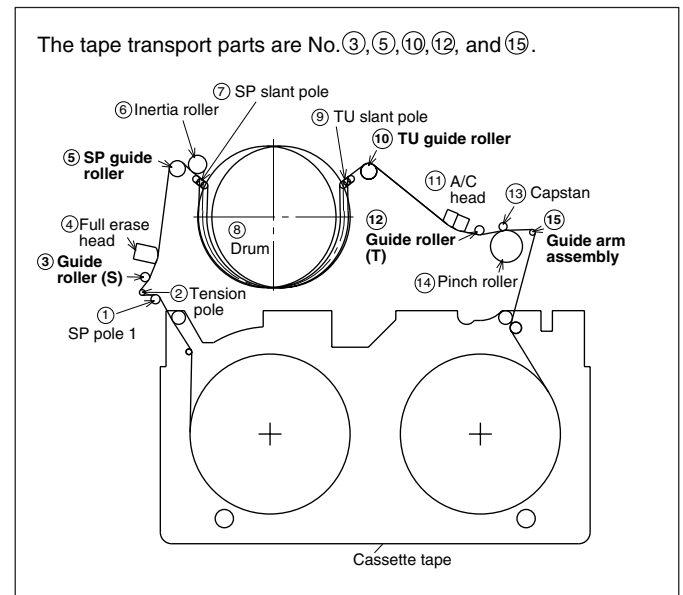


Fig. 2-5-8

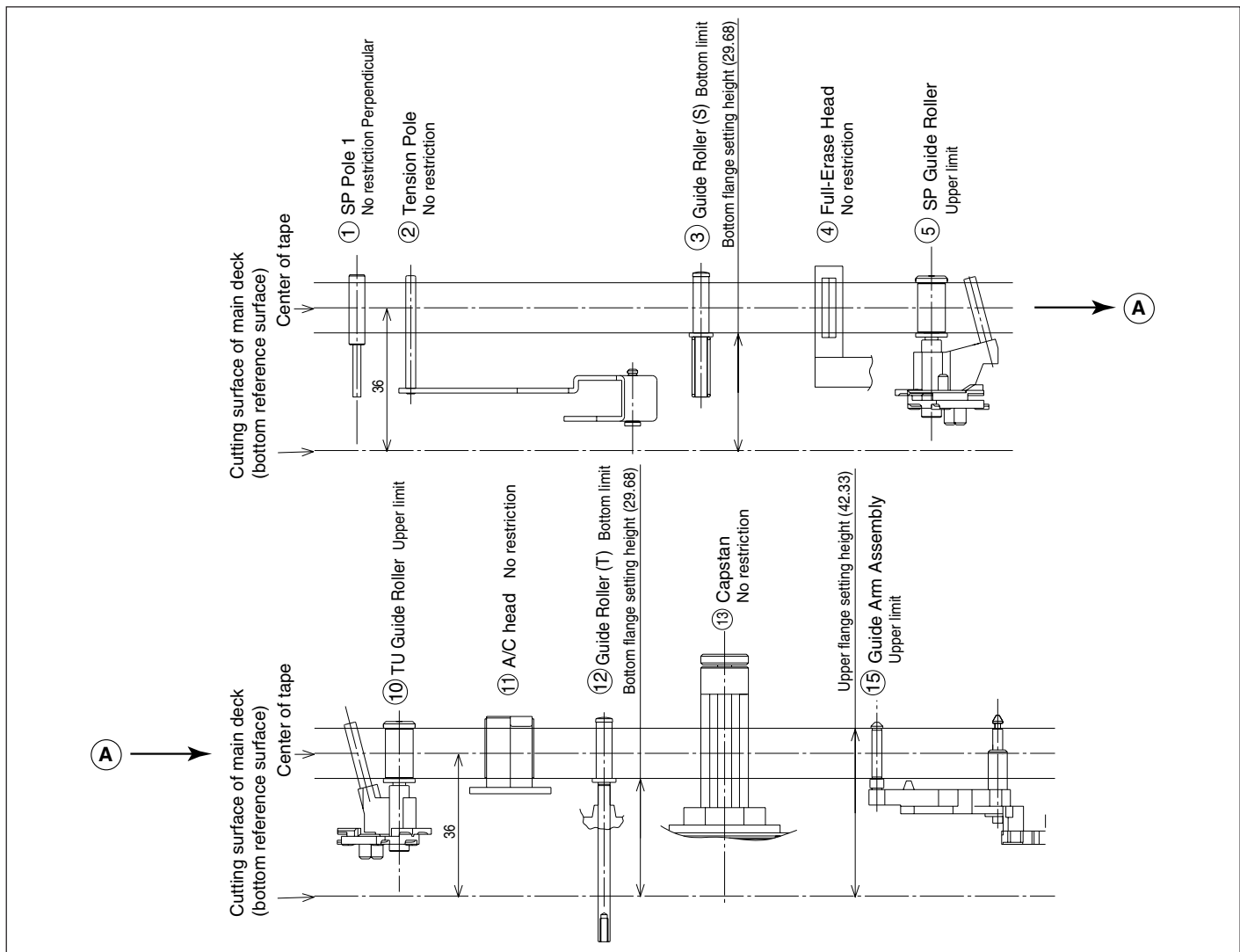


Fig. 2-5-9

② Tape transport system adjustment

(1) Guide roller (S), (T)

- (a) If creasing of the tape or other tape damage occurs at the guide roller (S) or (T), rotate the screws ⑦ and ⑧ in the tightening direction to lower the height of the guide roller (S)/(T). At this time, be sure not to rotate the screw for more than 1/2 turn.

To set the reference height of the guide rollers, tighten the screw once until it reaches the end, then rotate it by the following value in the releasing direction.

- Guide roller (S): 2.5 turns
- Guide roller (T): 1.5 turns

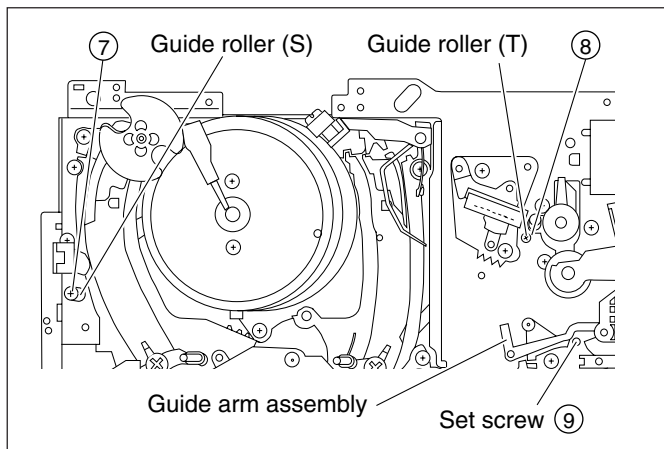


Fig. 2-5-10

(2) Guide arm assembly

- (a) If creasing of the tape or other tape damage occurs at the flange on the guide arm assembly, adjust as follows:
- (b) Eject the tape.
- (c) Rotate the set screw ⑨ clockwise to raise the height of the guide arm assembly. (Refer to Fig. 2-5-10)
- (d) Play back the tape, and repeat this procedure until the tape creasing or tape damage does not occur. If tape is twisted between the capstan and the guide arm assembly, fine adjust the height of the guide arm assembly.
- (3) When adjusting the tape transport parts, be sure to perform the interchangeability adjustment again. (Refer to Section 2.5.1, 2.5.2 and 2.5.3.)

SECTION 3 ELECTRICAL ADJUSTMENTS

3.1 PRECAUTIONS BEFORE PROCEEDING TO ELECTRICAL ADJUSTMENTS

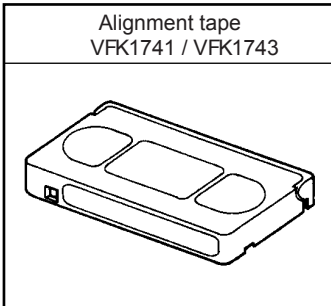
- (1) Before performing an electrical adjustment, make sure that the target point for the adjustment really is deviated and actually requires adjustment.
- (2) Ensure that the mechanism interchangeability adjustments have been completed before proceeding to electrical adjustments.
- (3) Before proceeding to electrical adjustments, leave the unit ON for more than 5 minutes after turning the power ON.
- (4) Use a 10:1 probe with the oscilloscope unless otherwise specified.

3.2 EQUIPMENT REQUIRED FOR ELECTRICAL ADJUSTMENTS

3.2.1 Measuring Instruments Required for Adjustments

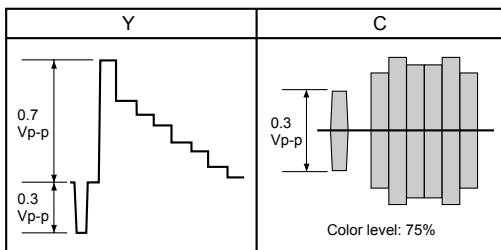
Instrument	Condition
Video signal generator [TG-7/2(Shibasoku), Model 1411 (Tektronix), Model 430 P (Leader), or equivalent]	Previously calibrated instrument.
Oscilloscope	Calibrated instrument with a 100 MHz or higher band measurement capability.
Color monitor TV	Instrument with a 75 Ω (video input.)
Multimeter	Calibrated instrument with a 10 M Ω or higher input impedance.

3.2.2 Tools to be Prepared

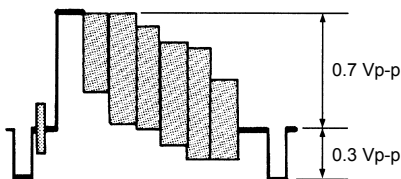


3.2.3 Signals Required for Adjustments

- (1) Y/C color bars signal

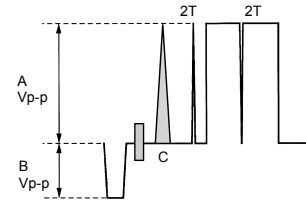


- (2) Composite color-bar signal (100% white, 75% chroma)

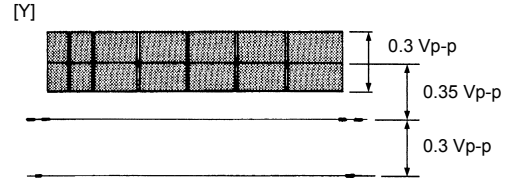


- (3) Composite pulse & bar signal

A = 0.7, B = 0.3, C = 20T



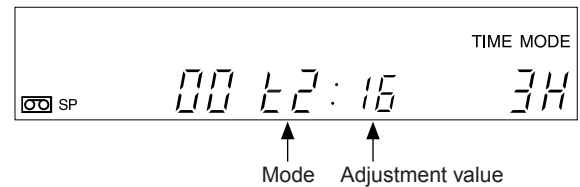
- (4) Y/C video sweep signal (B/W)



3.3 SERVICE MODES USED IN ADJUSTMENTS

3.3.1 SERVO ADJUST MODE Setting Method

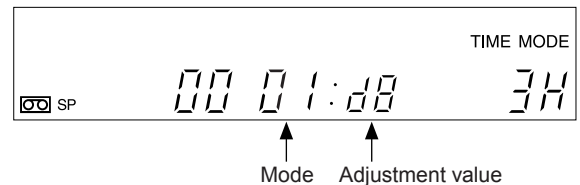
- (1) Press the [STOP], [PAUSE] and [MENU] buttons simultaneously
- (2) Press the [SHIFT▼] or [SHIFT▶] button to select "SERVO ADJUST", then press the [SET -] or [SET +] button.
- (3) The front panel FDP shows the following information.



- (4) Press the [SHIFT▼] or [SHIFT▶] button to switch the mode.
- (5) Press the [V.LOCK -] or [V.LOCK +] button to vary the adjustment value.
- (6) Press the [MENU] button to cancel the SERVICE MENU.

3.3.2 EVR ADJUST MODE Setting Method

- (1) Press the [STOP], [PAUSE] and [MENU] buttons simultaneously
- (2) Press the [SHIFT▼] or [SHIFT▶] button to select "EVR ADJUST", then press the [SET -] or [SET +] button.
- (3) The front panel FDP shows the following information.

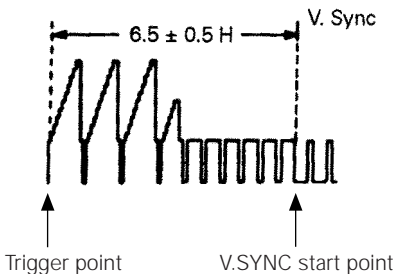


- (4) Press the [SHIFT▼] or [SHIFT▶] button to switch the mode.
- (5) Press the [V.LOCK -] or [V.LOCK +] button to vary the adjustment value.
- (6) Press the [MENU] button to cancel the SERVICE MENU.
- (7) When the [RESET/CANCEL], [SET -] and [SET +] buttons are pressed simultaneously in step (3), all of the adjustment values in the EVR ADJUST MODE will be reset.

3.4 SERVO ADJUSTMENTS

CAUTION

- ① If the video adjustments are not completed before proceeding to the servo adjustments, reset the EVR ADJUST MODE adjustment values as described in section 3.3.2 (7).
- ② Before performing the servo adjustments, recording should be done in 48H mode for two minutes. (The TL tape feed amount is automatically adjusted.)

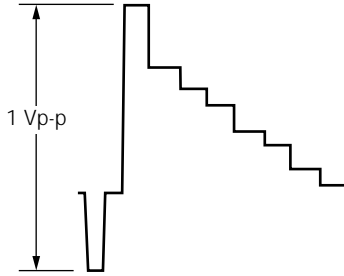
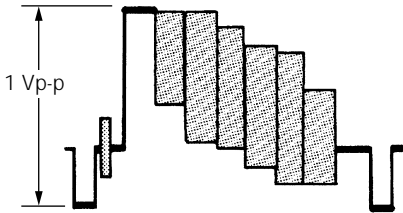
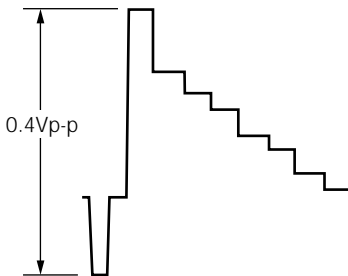
No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (①) Adjustment level (☆)	Adjustment procedure								
1	SW point adjustment	Oscilloscope (Trigger: D-FF), Alignment tape, VFK1741 	SERVO ADJUST t6 3H PB	◎ VIDEO OUT terminal, 75Ω terminated ① [V.LOCK-/+] buttons ☆ 6.5 H ± 0.5H	(1) Set SERVO ADJUST mode "t6" as described in the SERVO ADJUST MODE setting method. (2) Set the oscilloscope as shown below. <table border="1"><tr><th colspan="2">Oscilloscope setting</th></tr><tr><td>TRIG</td><td>TP4 [P/R]:7F</td></tr><tr><td>SLOPE</td><td>⊖</td></tr><tr><td>SWEEP TIME/DIV range</td><td>50 μs/DIV</td></tr></table> (3) Play the alignment tape, check FM wave form (TP5[P/R]: 8F) and optimize tracking. (4) Adjust the [V.LOCK-] or [V.LOCK +] button so that the duration from the trigger point to V.SYNC start point is 6.5H.	Oscilloscope setting		TRIG	TP4 [P/R]:7F	SLOPE	⊖	SWEEP TIME/DIV range	50 μs/DIV
Oscilloscope setting													
TRIG	TP4 [P/R]:7F												
SLOPE	⊖												
SWEEP TIME/DIV range	50 μs/DIV												
2	V-LOCK adjustment	Monitor TV, Color bar signal	SERVO ADJUST t3 3H REC ↓ 3H PB (PAUSE) L12H REC ↓ L12H PB L24H REC ↓ L24H PB	◎ VIDEO OUT terminal, 75Ω terminated ① [V.LOCK-/+] buttons ☆ Minimize vertical dancing of image	(1) Insert a S-VHS cassette tape. (2) Apply the color bar signal input. (3) Set SERVO ADJUST mode "t3" as described in the SERVO ADJUST MODE setting method. (4) Set to 3H mode with the [SET+] or [SET-] button, and perform recording and playback. (5) Press the [PAUSE] button and adjust the [V.LOCK -] or [V.LOCK +] button to minimize the vertical dancing. (6) Perform recording and playback in L12H mode. (7) Adjust the [V.LOCK-] or [V.LOCK +] button to minimize the vertical dancing. (8) Perform recording and playback in L24H mode. (9) Adjust the [V.LOCK-] or [V.LOCK +] button to minimize the vertical dancing.								
3	Slow tracking preset adjustment	Monitor TV, Color bar signal	SERVO ADJUST t2 3H REC ↓ 24H PB	◎ VIDEO OUT terminal, 75Ω terminated ① [V.LOCK-/+] buttons ☆ Minimize noise.	<div>CAUTION Do not use the tape section near the beginning or end.</div> (1) Apply the color bar signal input. (2) Set SERVO ADJUST mode "t2" as described in the SERVO ADJUST MODE setting method. (3) Perform recording in 3H mode and playback in 24H mode. (4) Adjust the [V.LOCK -] or [V.LOCK +] button to minimize noise at the top and bottom of the monitor screen.								

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (①) Adjustment level (☆)	Adjustment procedure
4	Skew adjustment	Monitor TV, Color bar signal		◎ VIDEO OUT terminal, 75Ω terminated ① [V.LOCK-/+] buttons ☆ Minimize vertical fluctuation of image	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> CAUTION Image skew during playback is greatly dependent on the AFC characteristics of the monitor TV. Use a tape section near the beginning. </div> <div> (1) Insert a S-VHS cassette tape. (2) Apply the color bar signal input. (3) Set to 48H mode with the [SET +] or [SET -] button, and perform recording. (4) Perform playback in 3H mode. (5) Check that the image at the top is not skewed. If it is skewed, go to steps (6) to (10). </div>
		<div style="border: 1px solid black; padding: 5px; text-align: center;"> [SERVO ADJUST MODE] 24H SLOW TRACKING (1B) 3HVLK (12) L12HVLK (FE) L24HVLK (FC) 48H TL MOVE (27) 48H SKW (1D) L12H SKW (70) L24H SKW (4C) \$W. POINT (33) </div> <p style="text-align: center;">OK</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> [SERVO ADJUST MODE] 24H SLOW TRACKING (1B) 3HVLK (12) L12HVLK (FE) L24HVLK (FC) 48H TL MOVE (27) 48H SKW (1D) L12H SKW (70) L24H SKW (4C) \$W. POINT (33) </div> <p style="text-align: center;">NG</p>	<div> 48H REC ↓ 3H PB </div> <div> SERVO ADJUST t5 48H REC ↓ 3H PB ↓ 48H REC </div>	<div>Checking</div> <div>Adjusting V. LOCK + : right deviation V. LOCK - : left deviation</div>	<div> (6) Set SERVO ADJUST mode "t5" as described in the SERVO ADJUST MODE setting method. (7) Record the color bar signal in 48H mode. (8) Every 10 seconds during recording, adjust the [V.LOCK-] or [V.LOCK +] button to vary "48H SKW (**)" at around 1D. (9) Play the recording in 3H mode and check "(**)" at which the image skew is minimum. (10) Perform recording in 48H mode and set the value to the data checked in step (9). </div>
			<div> L24H REC ↓ 3H PB </div>	Checking	<div> (11) Record the color bar signal in L24H mode. (12) Play the recording in 3H mode. (13) Check that top of image is not skewed. If it is skewed, go to steps (14) to (17). </div>
			<div> L24H REC ↓ 3H PB ↓ L24H REC </div>	Adjusting	<div> (14) Record the color bar signal in L24H mode. (15) Every 10 seconds during recording, adjust the [V.LOCK -] or [V.LOCK +] button to vary "L24H SKW (**)" at around 4C. (16) Play the recording in 3H mode and check "(**)" at which the image skew is minimum. (17) Perform recording in L24H mode and set the value to the data checked in step (16). </div>
			<div> L12H REC ↓ 3H PB </div>	Checking	<div> (18) Record the color bar signal in L12H mode. (19) Play the recording in 3H mode. (20) Check that top of image is not skewed. If it is skewed, go to steps (21) to (24). </div>
			<div> L12H REC ↓ 3H PB ↓ L12H REC </div>	Adjusting	<div> (21) Record the color bar signal in L12H mode. (22) Every 10 seconds during recording, adjust the [V.LOCK-] or [V.LOCK +] button to vary "L12H SKW (**)" at around 70. (23) Play the recording in 3H mode and check "(**)" at which the image skew is minimum. (24) Perform recording in L12H mode and set the value to the data checked in step (23). </div>

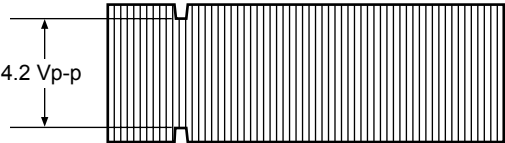
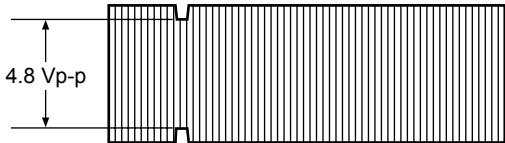
3.5 VIDEO ADJUSTMENTS

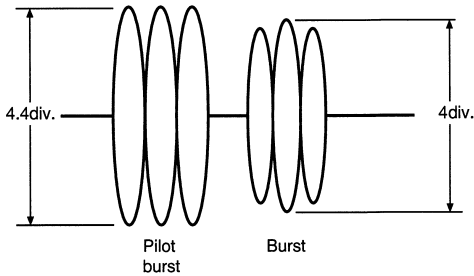
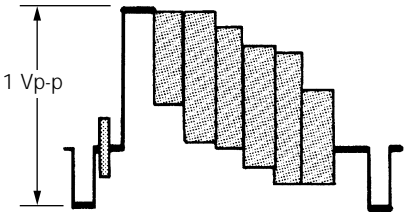
CAUTION

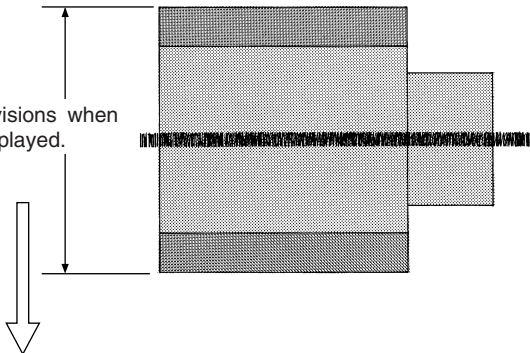
After replacing the IC607 on the MAIN board (EEPROM), reset the EVR ADJUST MODE adjustment values as described in section 3.3.2 (7), then proceed to the following video adjustments.

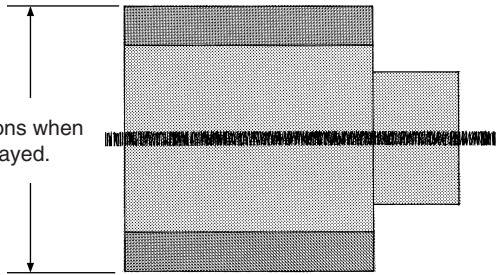
No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (①) Adjustment level (☆)	Adjustment procedure
1	AGC level adjustment	Oscilloscope (H rate), Color bar signal (Y/C) ↓ Y/C IN 	EE, EVR ADJUST 11	◎ Y/C Y OUT terminal, 75Ω terminated ① [V.LOCK-/+] buttons ☆ 1 Vp-p	(1) Press the [MENU] button, select the "VIDEO/ VTR MODE" of the main menu , and change the VIDEO INPUT to "YC". (2) Apply the color bar signal input. (3) Set EVR ADJUST mode "11" as described in the EVR ADJUST MODE setting method. (4) Adjust the [V.LOCK -] or [V.LOCK +] button to set the Y level at the measurement point to the adjustment level.
2	EE VIDEO level adjustment	Oscilloscope (H rate), Color bar signal ↓ VIDEO IN 	EE	◎ VIDEO OUT terminal, 75Ω terminated ① VR2 [MAIN]:16F ☆ 1 Vp-p	(1) Press the [MENU] button, select the "VIDEO/ VTR MODE" of the main menu , and change the VIDEO INPUT to "LINE". (2) Apply the color bar signal input. (3) Adjust the VR2 to set the video level at the measurement point to the adjustment level.
3	Sub-emphasis input level adjustment	Oscilloscope (H rate), Color bar signal ↓ VIDEO IN 	EE EVR ADJUST 15	◎ TP2 [MAIN]:10Q ① [V.LOCK-/+] buttons ☆ 0.4 Vp-p GND TP7 [MAIN]:15Q	(1) Apply the color bar signal input. (2) Set EVR ADJUST mode "15" as described in the EVR ADJUST MODE setting method. (3) Adjust the [V.LOCK -] or [V.LOCK +] button to set the Y level at the measurement point to the adjustment level.

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (*) Adjustment parts (-) Adjustment level (+)	Adjustment procedure
4	White & dark clip adjustment [S-VHS ET]	Oscilloscope (H rate), Pulse & bar signal ↓ VIDEO IN	EE, EVR ADJUST 14	* TP3 [MAIN] : 10Q - [V.LOCK -/+] buttons + White clip: 190% Dark clip: 70±10% GND TP7 [MAIN]: 15Q	(1) Insert a VHS cassette tape. (2) Apply the pulse & bar signal input. (3) Set EVR ADJUST mode "14" as described in the EVR ADJUST MODE setting method. (4) Adjust the oscilloscope gain so that the section between the sync tip and 100% white extends over 4.0 divisions. (5) Adjust the [V.LOCK -] or [V.LOCK +] button to set the white level at the measurement point to 190% (3.6 divisions). (6) Eject a VHS cassette tape.
	White & dark clip adjustment [S-VHS]			* TP3 [MAIN] : 10Q - [V.LOCK -/+] buttons + White clip: 210% Dark clip: 70±10% GND TP7 [MAIN]: 15Q	(7) Apply the pulse & bar signal input. (8) Set EVR ADJUST mode "14" as described in the EVR ADJUST MODE setting method. (9) Adjust the oscilloscope gain so that the section between the sync tip and 100% white extends over 4.0 divisions. (10) Adjust the [V.LOCK -] or [V.LOCK +] button to set the white level at the measurement point to 210% (4.4 divisions).
5	Carrier & deviation adjustments	Frequency Counter No signal input	3H REC	* TP1 [P/R]: 4F GND TP3 [P/R]: 5F	(1) Apply the color bar signal input. (2) Turn OFF the power of the unit. (3) Connect the jumper wire between TP2 and TP7 (GND) on the MAIN board. (4) Connect the frequency counter to TP1 on the R/P board. (5) Turn ON the power of the unit.

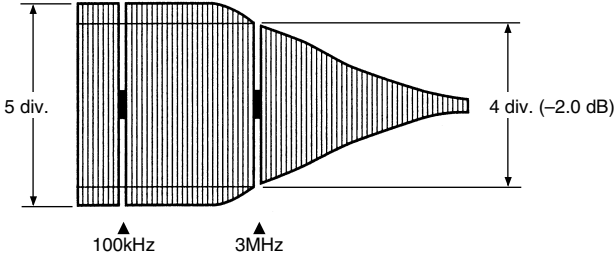
No.	Item	Measuring instruments & Input signals	Mode	Measuring point (*) Adjustment parts (-) Adjustment level (+)	Adjustment procedure
			EVR ADJUST 12 (Carrier)	* [V.LOCK-/+] buttons + Carrier: 5.4 MHz	(6) Insert a S-VHS cassette tape. (7) Set EVR ADJUST mode "12" as described in the EVR ADJUST MODE setting method. (8) Set the 3H mode by pressing the [SET-] or [SET +] button. (9) Press the [REC] button. (10) Adjust the [V.LOCK-] or [V.LOCK +] button to set carrier frequency to 5.4MHz. (as close a point)
6	S-VHS ET SP REC FM level adjustment	Oscilloscope (Trigger:D-FF TP4 [P/R]: 7F _d Slope), Color bar signal ↓ VIDEO IN 	3H REC EVR ADJUST 01	* TP1 [P/R]: 4F - [V.LOCK-/+] buttons + 4.2 Vp-p GND TP3 [P/R]: 5F	(1) Insert a VHS cassette tape. (2) Apply the color bar signal input. (3) Set EVR ADJUST mode "01" as described in the EVR ADJUST MODE setting method. (4) Set the 3H mode by pressing the [SET -] or [SET +] button. (5) Press the [REC] button. (6) Adjust the [V.LOCK-] or [V.LOCK +] button to set the FM level at the adjustment point to the adjustment level.
7	S-VHS SP REC FM level adjustment	Oscilloscope (Trigger:D-FF TP4 [P/R]: 7F _d Slope), Color bar signal ↓ VIDEO IN 	3H REC EVR ADJUST 01	* TP1 [P/R]: 4F - [V.LOCK-/+] buttons + 4.8 Vp-p GND TP3 [P/R]: 5F	(1) Insert a S-VHS cassette tape. (2) Apply the color bar signal input. (3) Set EVR ADJUST mode "01" as described in the EVR ADJUST MODE setting method. (4) Set the 3H mode by pressing the [SET -] or [SET +] button. (5) Press the [REC] button. (6) Adjust the [V.LOCK-] or [V.LOCK +] button to set the FM level at the adjustment point to the adjustment level.

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (⊙) Adjustment parts (Ⓜ) Adjustment level (☆)	Adjustment procedure
8	Pilot burst level adjustment	Oscilloscope (Trigger: VIDEO OUT, H rate), Color bar signal ↓ VIDEO IN 	EE EVR ADJUST 16	⊙ TP5 [MAIN] Ⓜ [V.LOCK -/+] buttons ☆ Burst level × 1.1	(1) Apply the color bar signal input. (2) Set EVR ADJUST mode "16" as described in the EVR ADJUST MODE setting method. (3) Adjust the oscilloscope gain so that the burst signal level becomes 4 divisions. (4) Adjust the [V.LOCK -] or [V.LOCK +] button to set the pilot burst level at the measurement point to 4.4 divisions.
9	S-VHS PB Y level adjustment	Oscilloscope (H rate), Color bar signal ↓ VIDEO IN 	3H REC ↓ 3H PB EVR ADJUST 10	⊙ VIDEO OUT terminal, 75Ω terminated Ⓜ [V.LOCK -/+] buttons ☆ 1 Vp-p	(1) Insert a S-VHS cassette tape. (2) Apply the color bar signal input. (3) Set EVR ADJUST mode "10" as described in the EVR ADJUST MODE setting method. (4) Record the color bar signal and play it back. (5) Adjust the [V.LOCK -] or [V.LOCK +] button to set the Y level (100% white) at the adjustment point to the adjustment level.
10	LC VCO level adjustment	Digital voltmeter, Color bar signal ↓ VIDEO IN	EE	⊙ TP4 [MAIN]: 12Q Ⓜ FL3 [MAIN]: 11I ☆ $2.5 \pm 0.1V_{DC}$ GND TP7 [MAIN]: 15Q	(1) Tilt the MAIN board as described in section 1.1.7 (1), (2) and (3). (2) Apply the color bar signal input. (3) Adjust the FL3 to set the DC level to the adjustment level.

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (⊙) Adjustment parts (Ⓜ) Adjustment level (☆)	Adjustment procedure
11	S-VHS ET SP REC color level adjust- ment	Oscilloscope (Trigger:D-FF TP4[P/R]:7F), Color bar signal, Alignment tape VFK1743	SP mode 3H PB 3H REC ↓ 3H PB EVR ADJUST 02	⊙ TP6 [P/R]: 8F Ⓜ [V.LOCK -/+] buttons ☆ +1.0 dB GND TP3 [P/R]: 5F V.LOCK +: Level UP V.LOCK -: Level DOWN	(1) Apply the color bar signal input. (2) Play the alignment tape and adjust tracking to maximize the color level. (3) Adjust the oscilloscope gain so that the channel with the higher level becomes 4 divisions. (4) Insert a VHS cassette tape, record and play the color bar signal. (5) Ensure that the color level of the channel with the higher level is +1.0 dB of the level in step (3) (i.e. occupying 4.5 divisions). (6) If adjustment is required, set EVR ADJUST mode "02", adjust the [V.LOCK -] or [V.LOCK +] button to set the color level before recording, and perform checking in steps (4) and (5) again.
<div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center; margin-right: 20px;"> <p>Set to 4 divisions when VFK1743 is played.</p>  <p>Check that this is 4.5 divisions when material recorded with the same unit is played.</p> </div> <div style="border: 1px solid black; padding: 5px; width: 300px;"> <p>CAUTION After the SP mode adjustments, be sure to perform SP TL mode adjustments in steps (7) to (12).</p> </div> </div>					
			SP TL mode 3H PB 24H REC ↓ 3H PB	☆ +1.0 to 0 dB	(7) Play the alignment tape in 3H mode and adjust tracking to maximize the color level. (8) Adjust the oscilloscope gain so that the channel with the higher level becomes 4 divisions. (9) Insert a VHS cassette tape. (10) Record the color bar signal in 24H mode and play the recording in 3H mode. (11) Ensure that the color level of the channel with the higher level is between +1.0 and 0 dB of the level in step (8) (i.e. occupying 4.5 to 4 divisions). (12) If adjustment is required, set EVR ADJUST mode "02", adjust the [V.LOCK -] or [V.LOCK +] button to set the color level before recording, and perform checking in steps (9) to (11) again.

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (⊙) Adjustment parts (⬆) Adjustment level (☆)	Adjustment procedure
12	S-VHS SP REC color level adjust- ment	Oscilloscope (Trigger:D-FF TP4[P/R]:7F), Color bar signal, Alignment tape VFK1743	SP mode 3H PB 3H REC ↓ 3H PB EVR ADJUST 02	⊙ TP6 [P/R]: 8F ⬆ [V.LOCK -/+] buttons ☆ +2.0 dB GND TP3 [P/R]: 5F V.LOCK +: Level UP V.LOCK -: Level DOWN	(1) Apply the color bar signal input. (2) Play the alignment tape and adjust tracking to maximize the color level. (3) Adjust the oscilloscope gain so that the channel with the higher level becomes 4 divisions. (4) Insert a S-VHS cassette tape, record and play the color bar signal. (5) Ensure that the color level of the channel with the higher level is +2.0 dB of the level in step (3) (i.e. occupying 5 divisions). (6) If adjustment is required, set EVR ADJUST mode "02", adjust the [V.LOCK -] or [V.LOCK +] button to set the color level before recording, and perform checking in steps (4) and (5) again.
<div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center; margin-right: 20px;"> <p>Set to 4 divisions when VFK1743 is played.</p>  <p>Check that this is 5 divisions when material recorded with the same unit is played.</p> </div> <div style="border: 1px solid black; padding: 10px; width: 300px;"> <p>CAUTION After the SP mode adjustments, be sure to perform SP TL mode adjustments in steps (7) to (12).</p> </div> </div>					
			SP TL mode 3H PB 24H REC ↓ 3H PB	☆ +1.0 to 2.0dB	(7) Play the alignment tape in 3H mode and adjust tracking to maximize the color level. (8) Adjust the oscilloscope gain so that the channel with the higher level becomes 4 divisions. (9) Insert a S-VHS cassette tape. (10) Record the color bar signal in 24H mode and play the recording in 3H mode. (11) Ensure that the color level of the channel with the higher level is between +1.0 and 2.0 dB of the level in step (8) (i.e. occupying 4.5 to 5 divisions). (12) If adjustment is required, set EVR ADJUST mode "02", adjust the [V.LOCK -] or [V.LOCK +] button to set the color level before recording, and perform checking in steps (9) to (11) again.

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (⊙) Adjustment parts (Ⓜ) Adjustment level (☆)	Adjustment procedure
13	Frequency response adjustment	Oscilloscope (Trigger:D-FF TP4[P/R]:7F), Y/C video sweep signal ↓ Y/C IN	3H REC ↓ 3H PB	⊙ Y/C Y OUT terminal, 75Ω terminated Ⓜ VR4 [MAIN]: 15M ☆ 4 div. (3 MHz)	(1) Press the [MENU] button, select the "VIDEO/ VTR MODE" of the main menu, and change the VIDEO INPUT to "YC". (2) Insert a S-VHS cassette tape. (3) Record the Y/C video sweep signal and play it back. (4) Adjust the oscilloscope gain so that the 100kHz level becomes 5 divisions. (5) Adjust the VR4 to set the 3 MHz level at the measurement point to the adjustment level.




SECTION 4

BLOCK DIAGRAMS & SCHEMATIC DIAGRAMS & CIRCUIT BOARD DIAGRAMS

NOTE:


BE SURE TO MAKE YOUR ORDERS OF REPLACEMENT PARTS ACCORDING TO PARTS LIST.

CAUTION

THE  MARK INDICATES THE PRIMARY CIRCUIT TO DISTINGUISH THE PRIMARY FROM THE SECONDARY CIRCUIT.

PAY ATTENTION NOT TO RECEIVE AN ELECTRIC SHOCK DURING REPAIR AND SERVICE OF THE PRODUCTS.

IMPORTANT SAFETY NOTICE:

COMPONENTS IDENTIFIED WITH THE MARK  HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SAME TYPE.

■ SCHEMATIC DIAGRAM NOTES

- **Voltage and waveform measurements.**

Voltage: Measured with digital voltmeter in the 3H (REC and PB).

Value in () is voltage measured in the 3H playback mode, and it is different from that in the recording.

Voltage in REC and PB mode were measured under certain condition as blow.


REC -- Recording color bars signal.

PB -- Playing back recorded color bars signal.

- **Waveform:** Measured by supplying the color bars signal and 1kHz, -6dBs sine wave in 3H REC or PB mode.

- **Signal flow on the diagram**

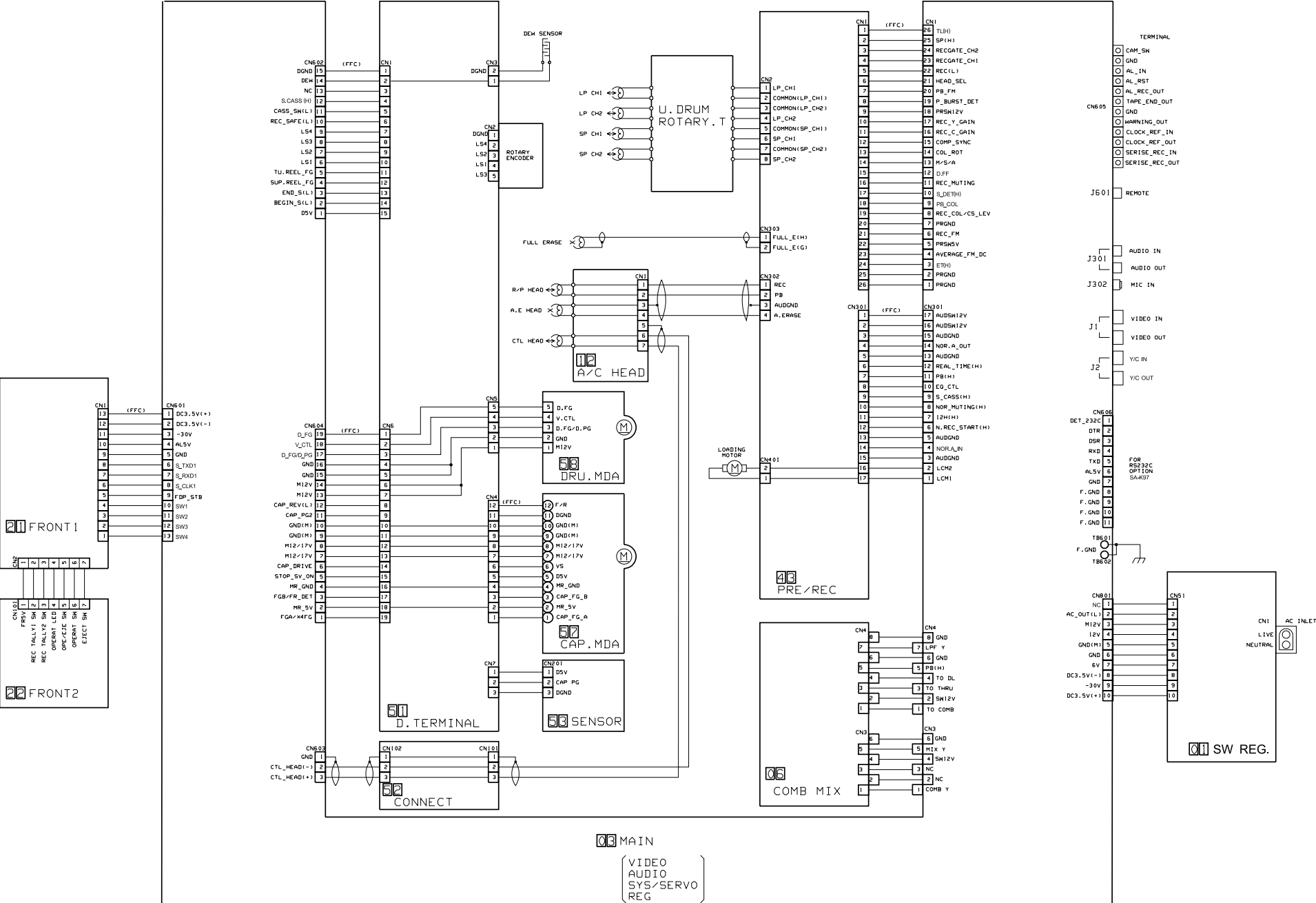
The following arrow marks indicate the specified signal parts respectively.

 : RECORDING or E-E SIGNAL PATH 3H mode

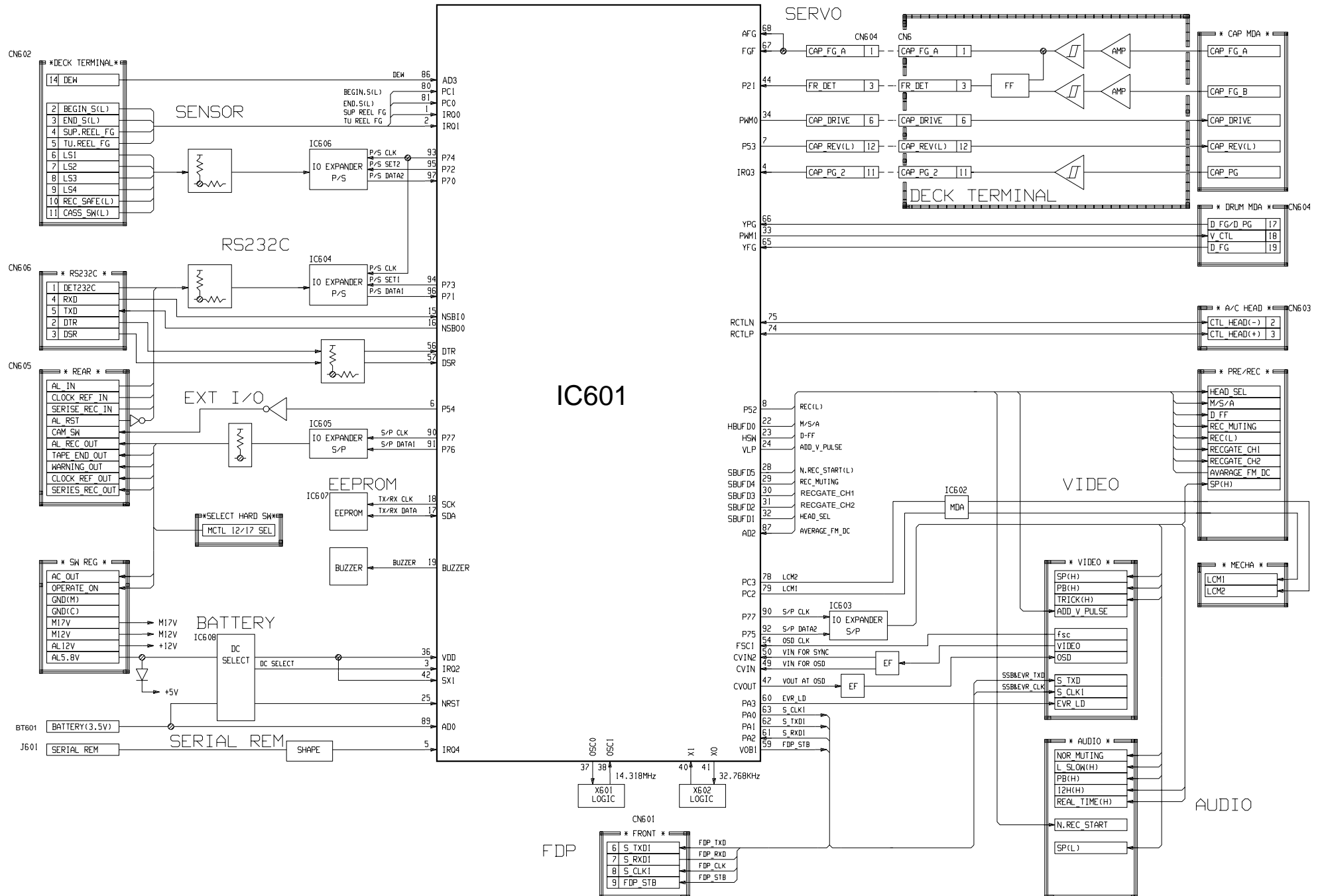
 : PLAYBACK SIGNAL PATH 3H mode

 : REC/PLAY SIGNAL PATH 3H mode

4.1 OVERALL WIRING DIAGRAMS

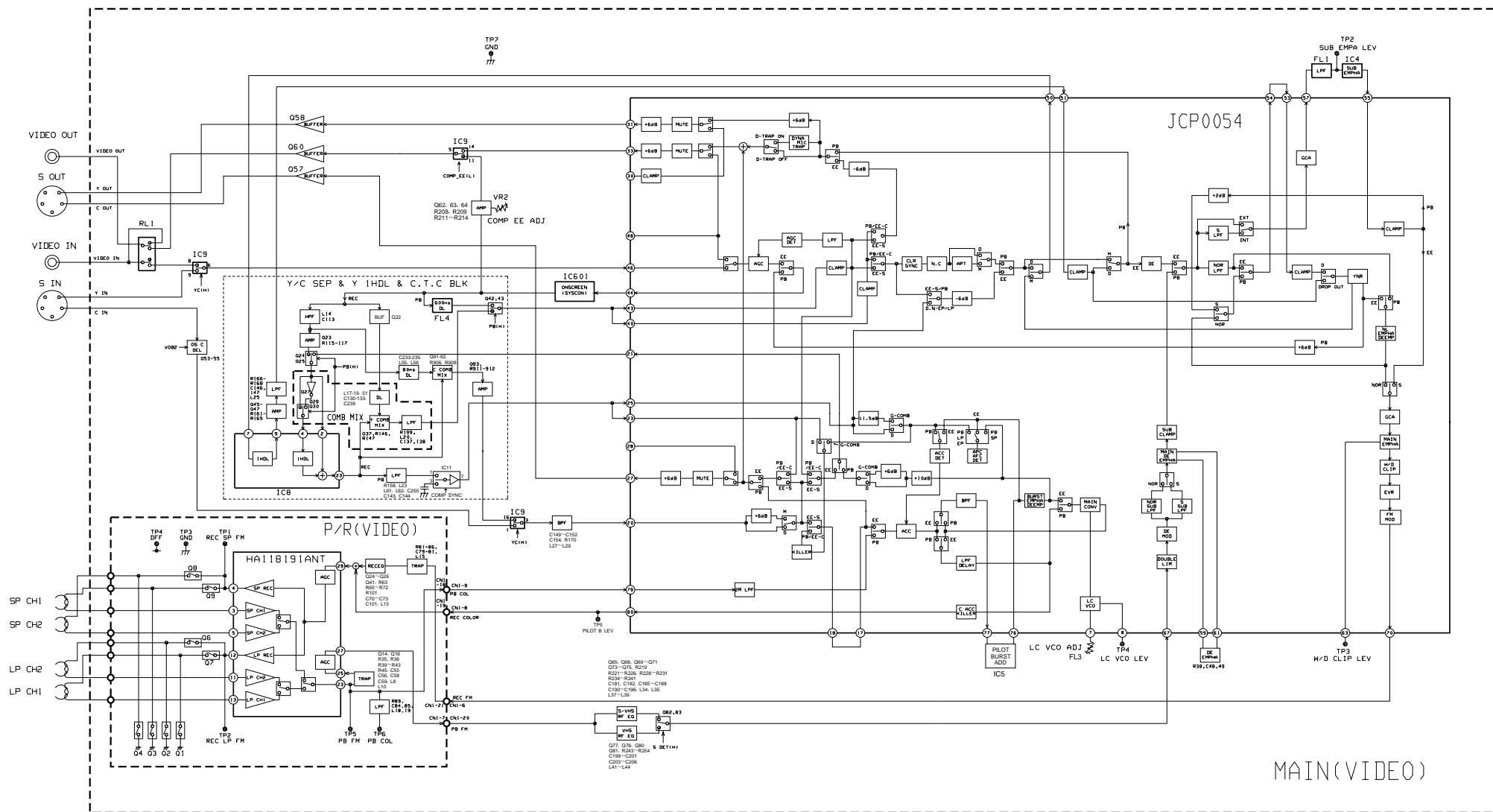


4.2 SYSCON/SERVO BLOCK DIAGRAM

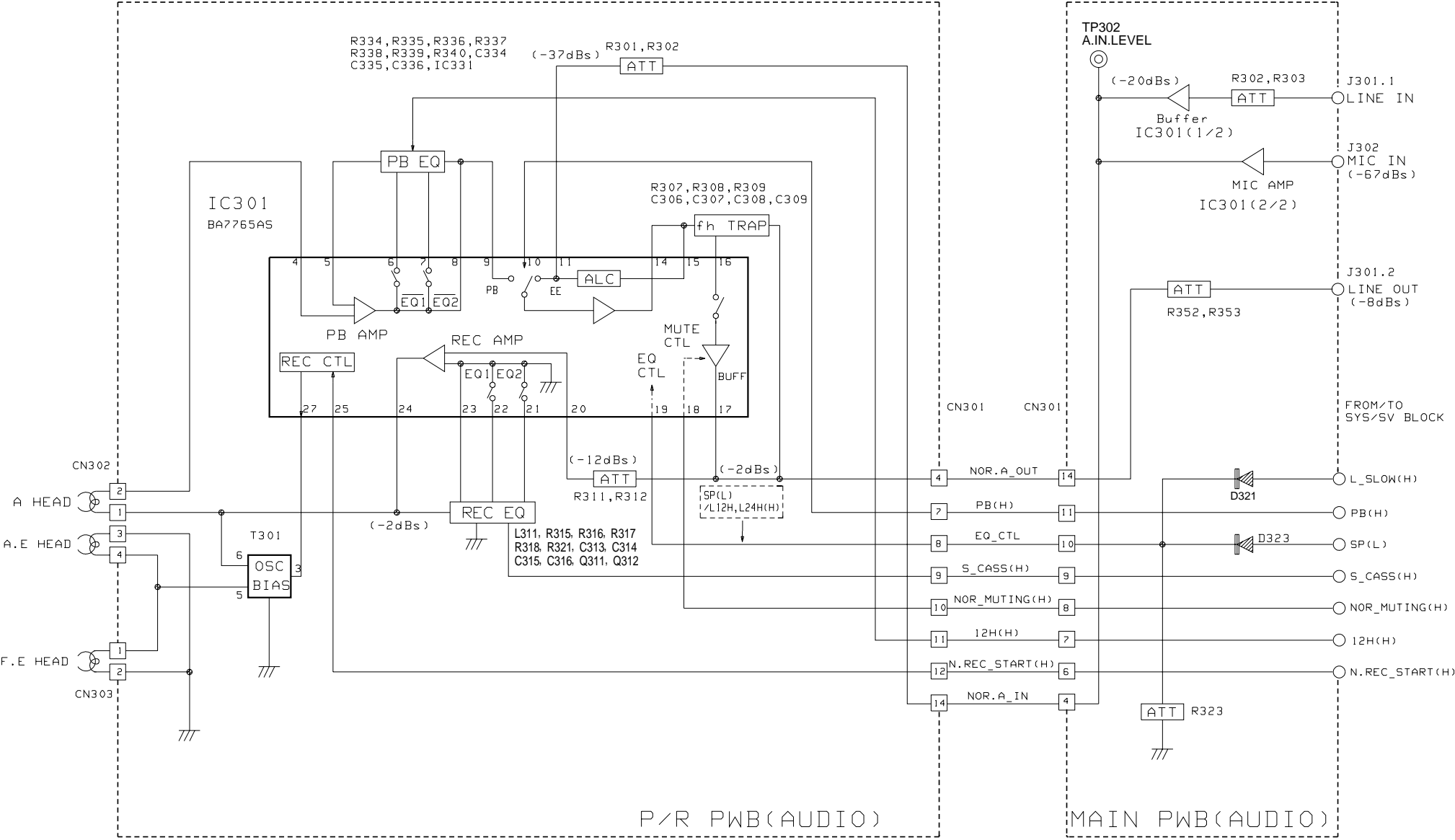


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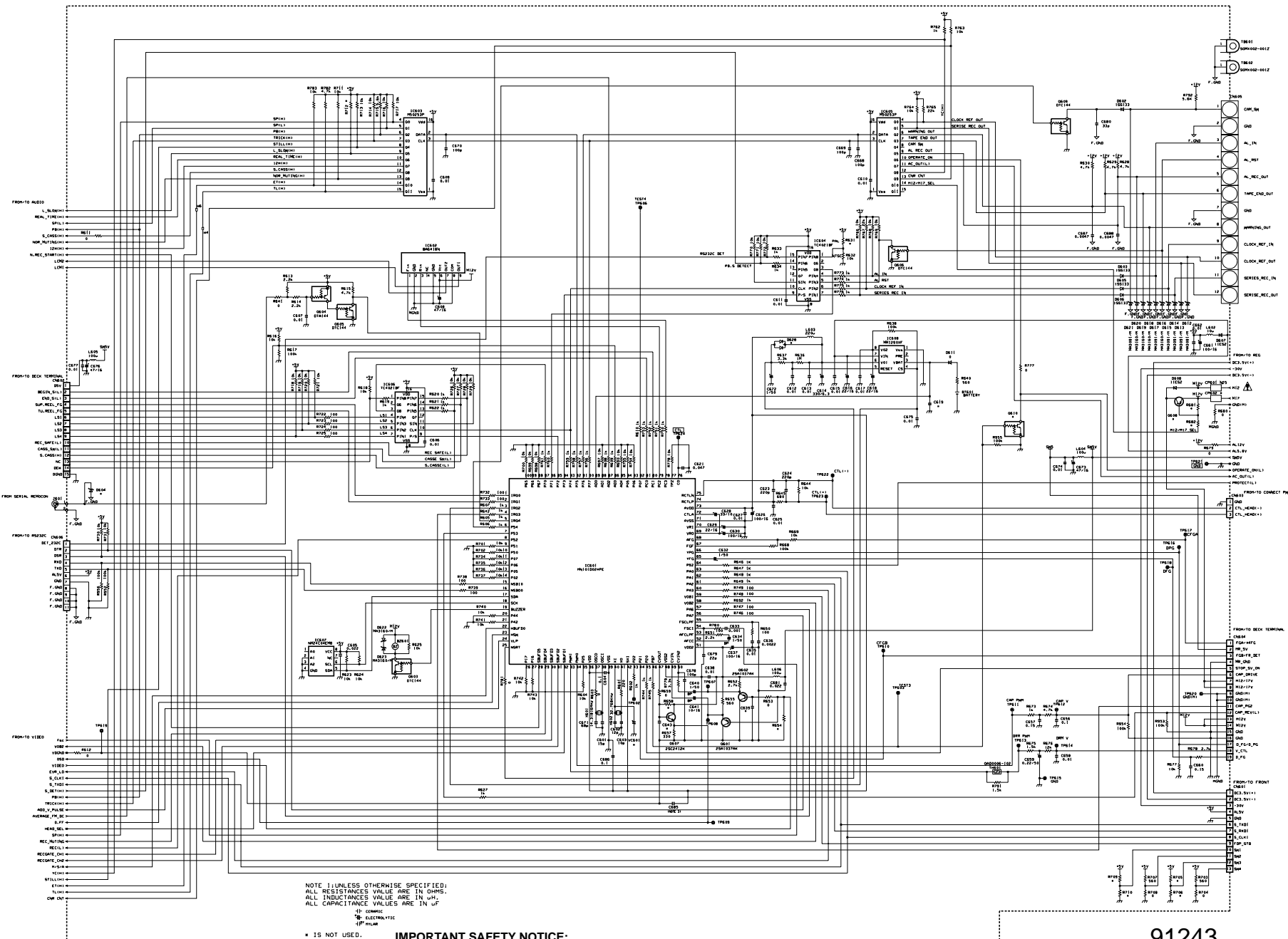
4.3 VIDEO BLOCK DIAGRAM



4.4 AUDIO BLOCK DIAGRAM



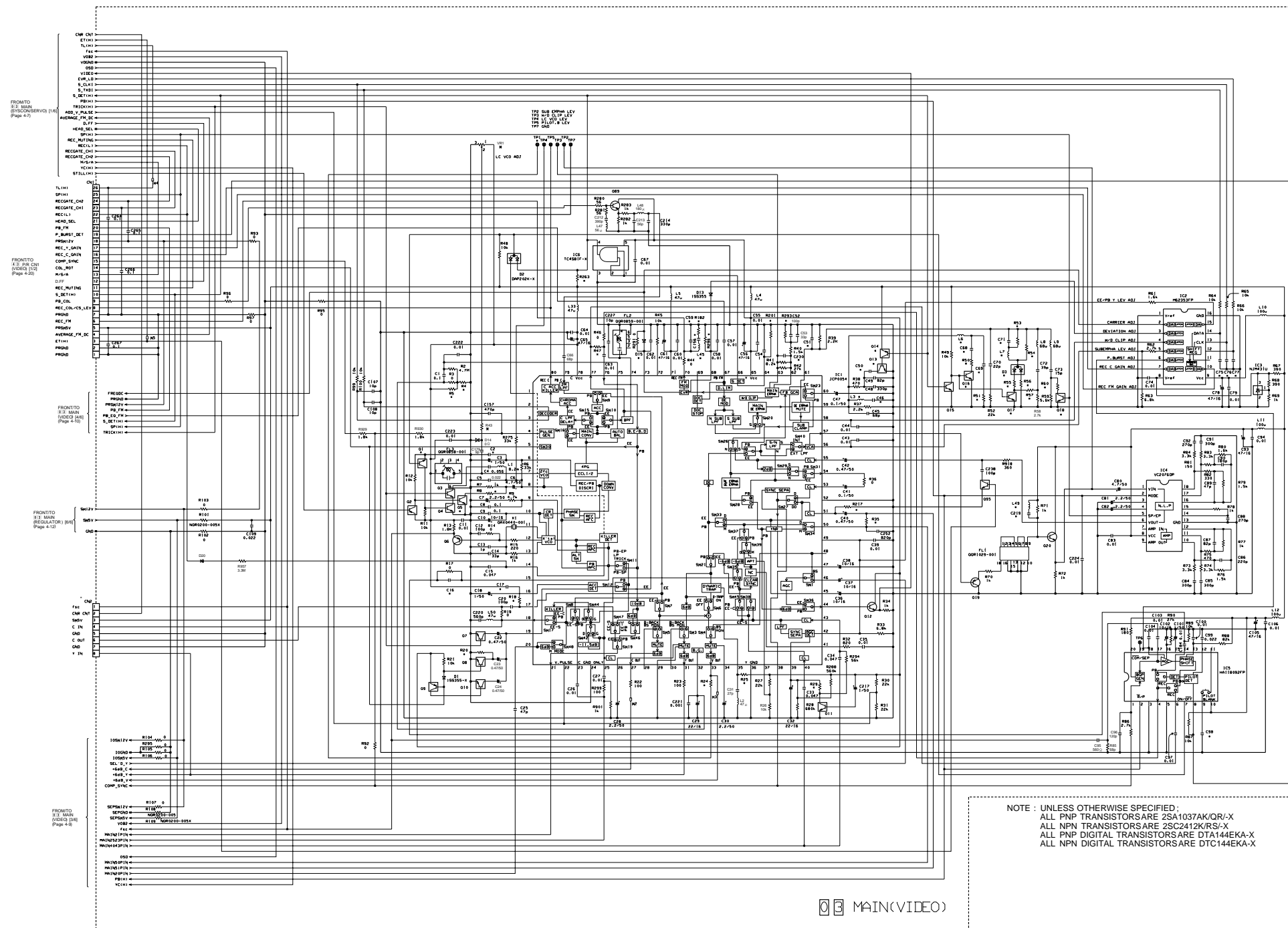
4.5 MAIN BOARD SCHEMATIC DIAGRAMS [1/6]
4.5.1 SYSCON/SERVO



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4.5 MAIN BOARD SCHEMATIC DIAGRAMS [2/6]

4.5.2 VIDEO (1/3)



MAIN(VIDEO)

4.5.3 VIDEO (2/3)

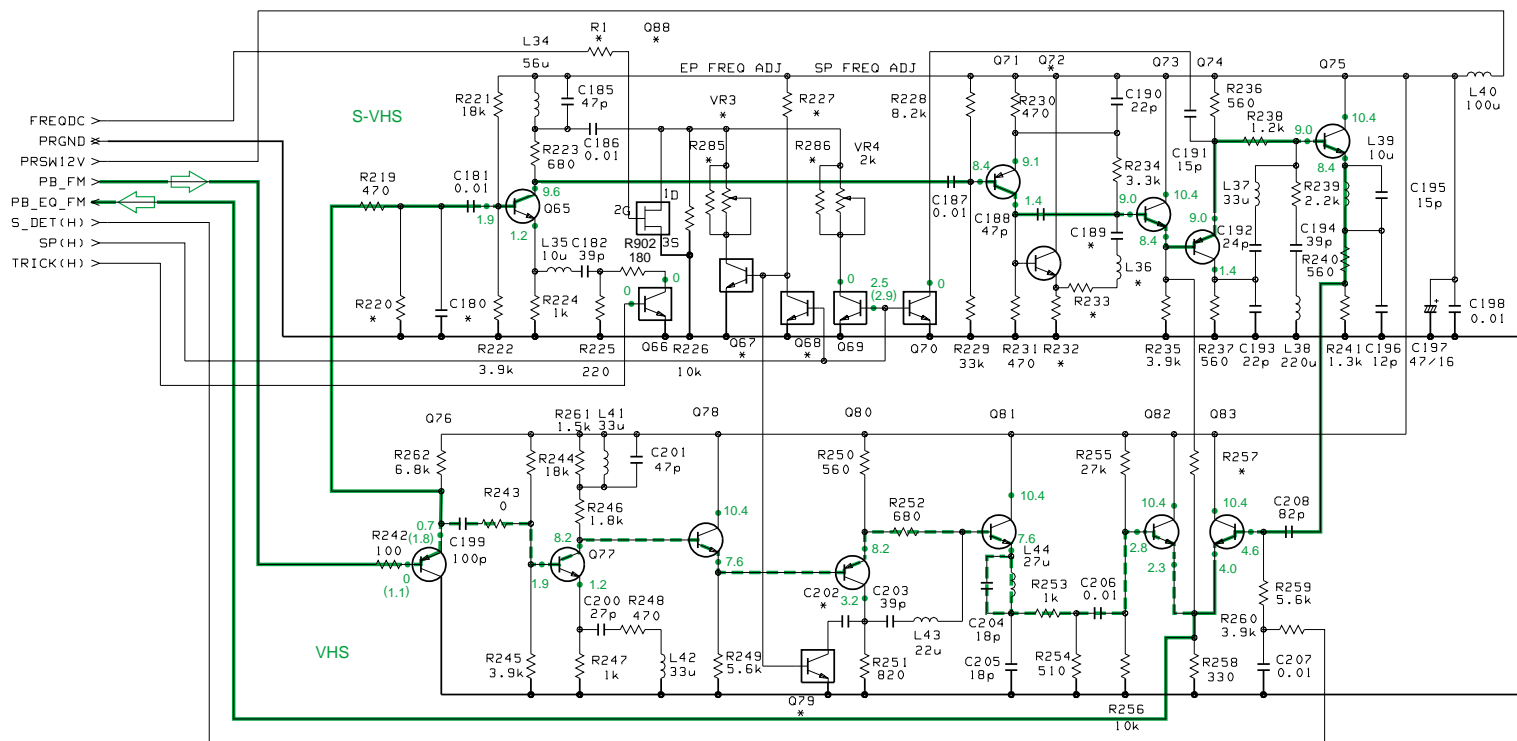


✖ : OPEN 91204 (2/3)

4.5 MAIN BOARD SCHEMATIC DIAGRAMS [4/6]

4.5.4 VIDEO (3/3)

FROM/TO
⑥/③ MAIN
(VIDEO) [2/6]
(Page 4-8)

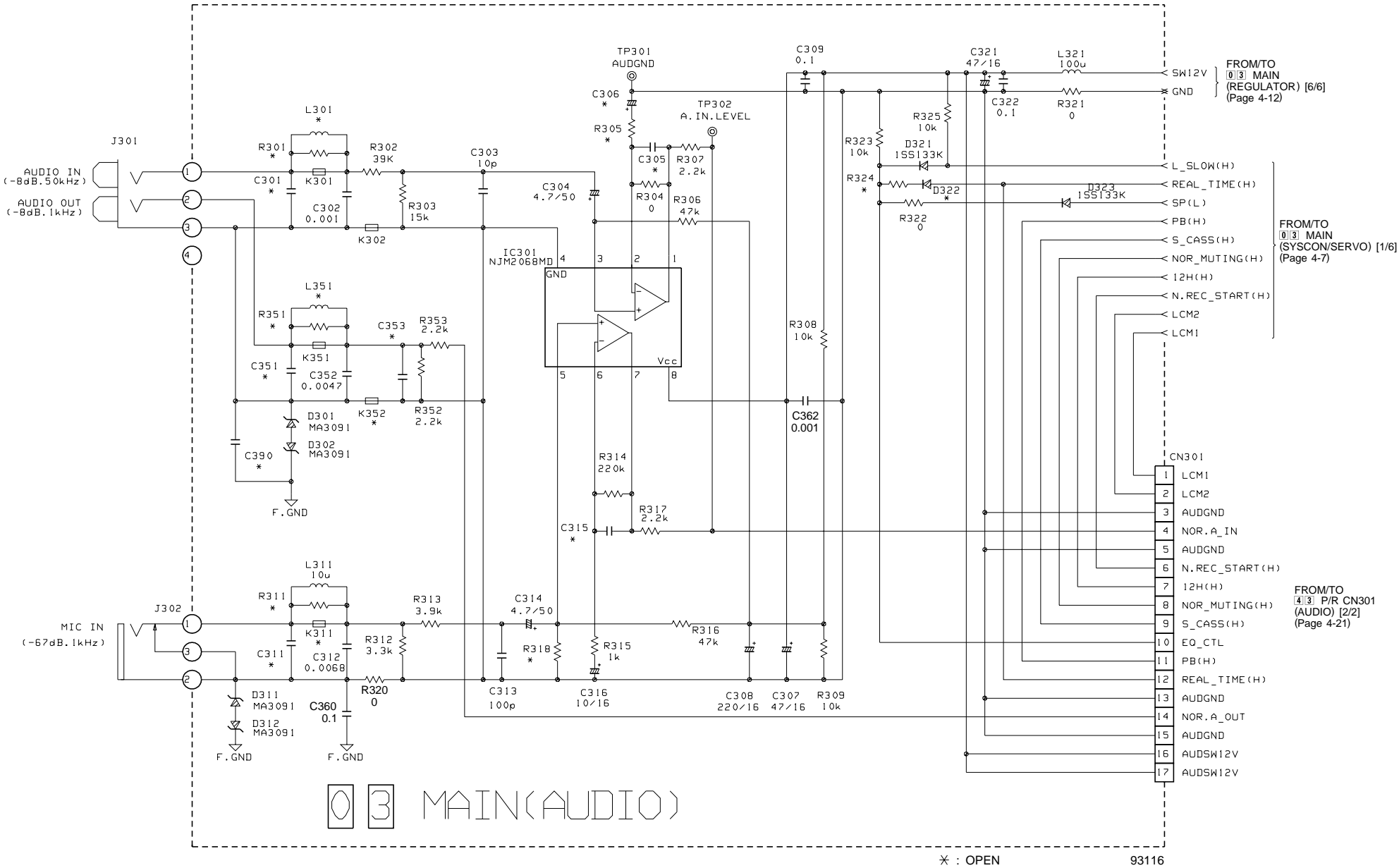


⑥/③ MAIN(VIDEO)

NOTE : UNLESS OTHERWISE SPECIFIED;
ALL PNP TRANSISTORS ARE 2SA1037AK/QR/-X
ALL NPN TRANSISTORS ARE 2SC2412K/RS/-X
ALL PNP DIGITAL TRANSISTORS ARE DTA144EKA-X
ALL NPN DIGITAL TRANSISTORS ARE DTC144EKA-X

※ : OPEN 91204 (3/3)

4.5 MAIN BOARD SCHEMATIC DIAGRAMS [5/6]
4.5.5 AUDIO

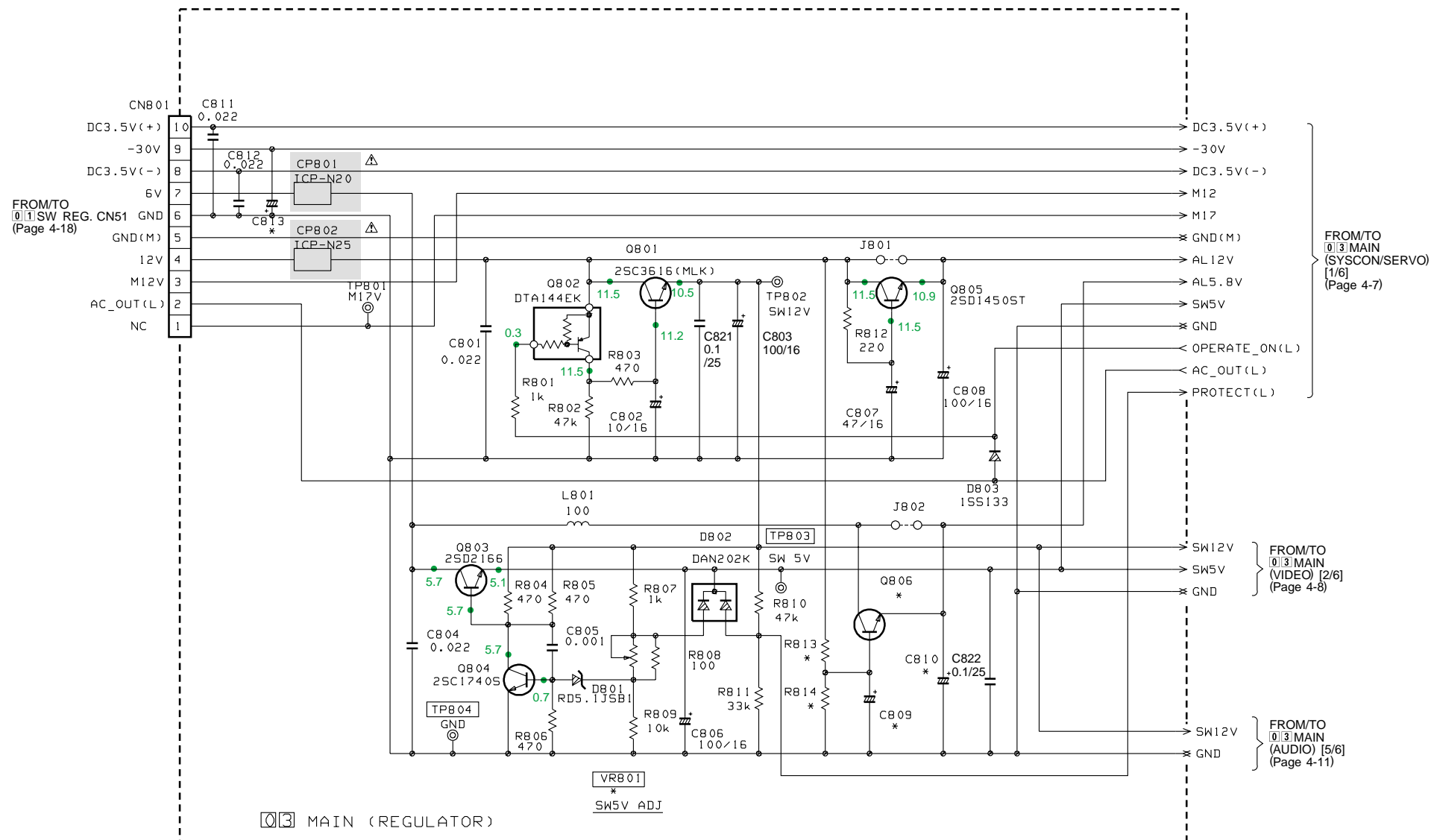


4.5 MAIN BOARD SCHEMATIC DIAGRAMS [6/6]

4.5.6 REGULATOR


IMPORTANT SAFETY NOTICE:

COMPONENTS IDENTIFIED WITH THE MARK  HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SAME TYPE.



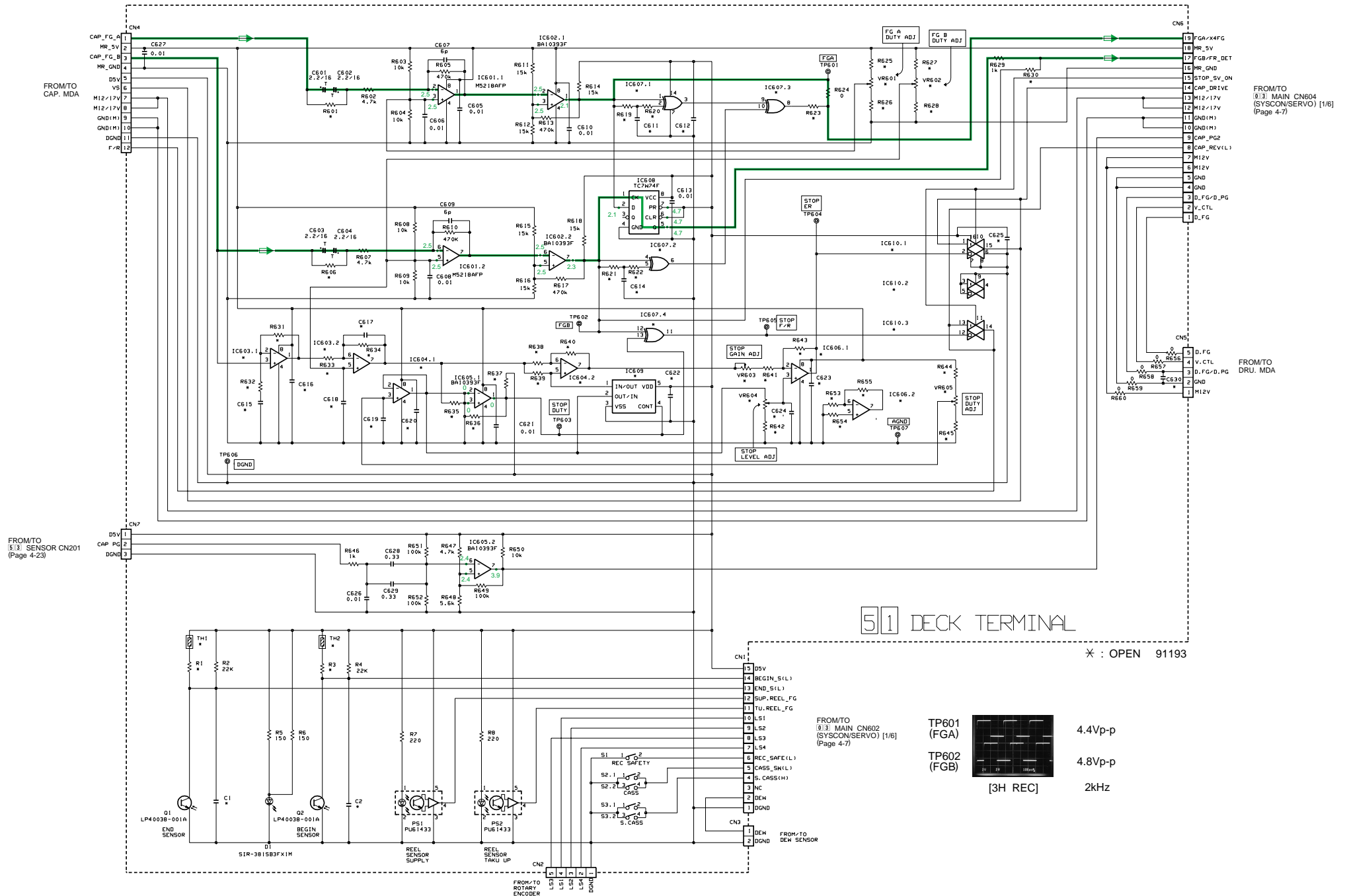
* : OPEN 93092

--- MAIN ---

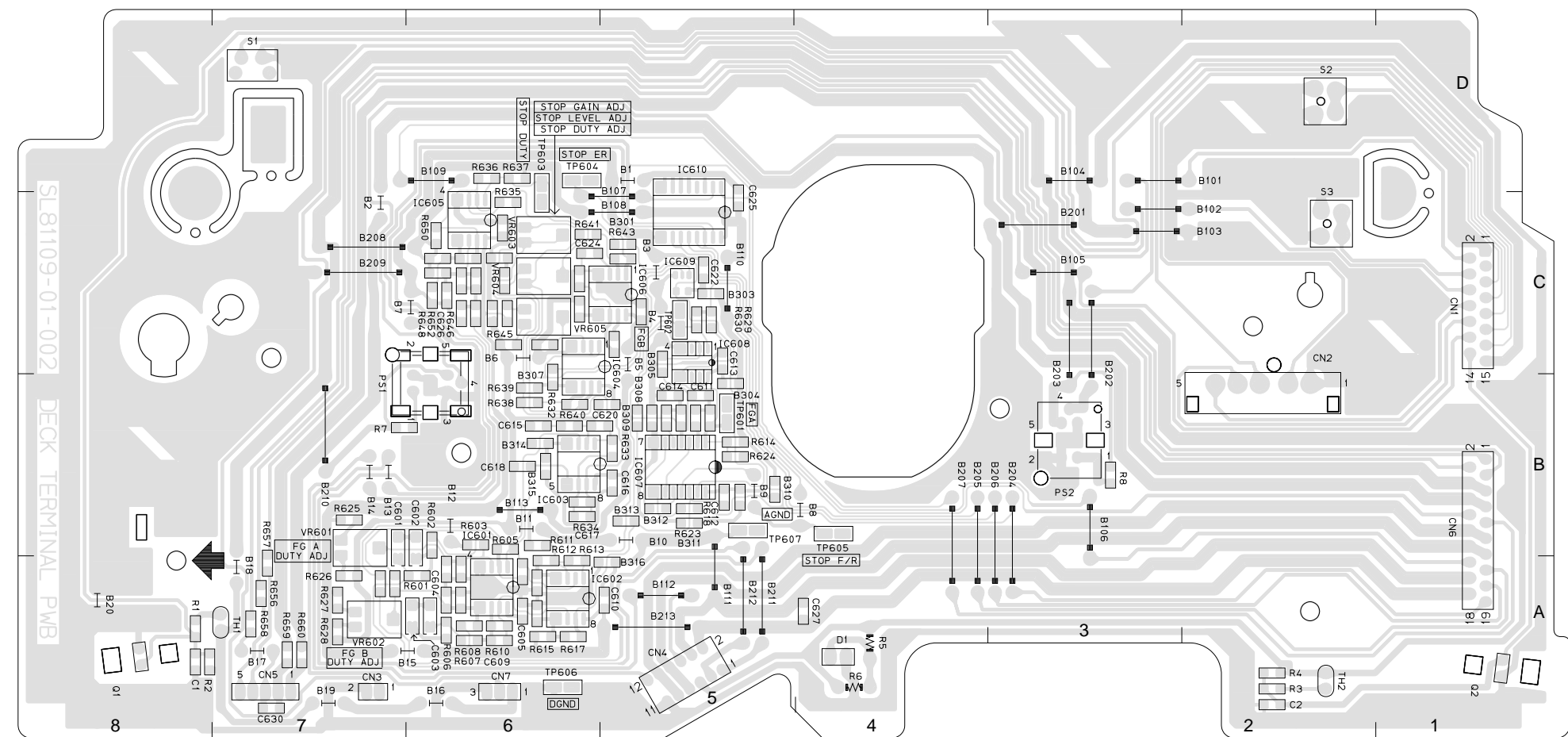
COMPONENTS IDENTIFIED WITH THE MARK  HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SAME TYPE.



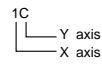
4.7 DECK TERMINAL BOARD SCHEMATIC DIAGRAM



4.8 DECK TERMINAL CIRCUIT BOARD

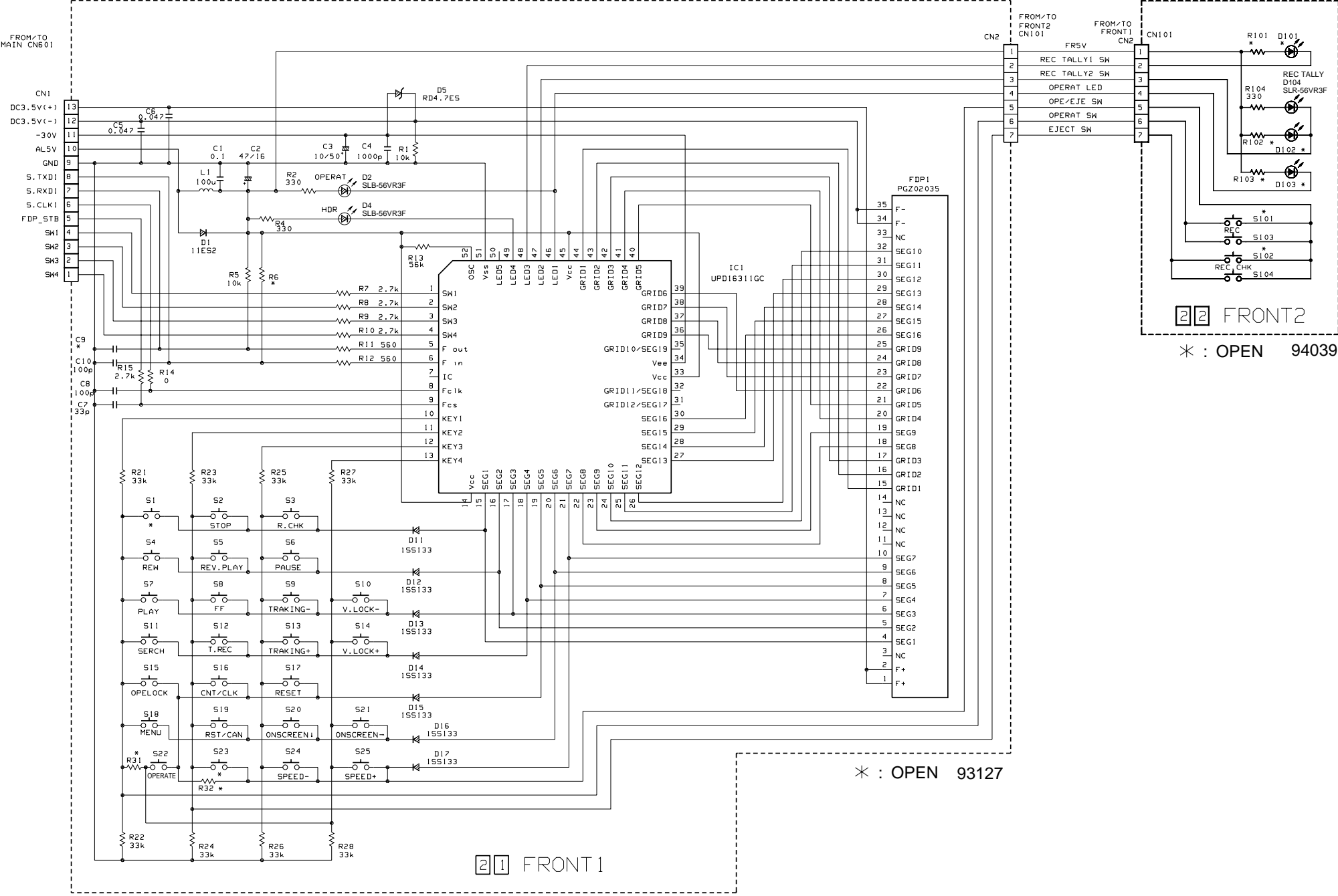


● ADDRESS LABEL OF BOARD PARTS
Each address may have an address error by one interval.

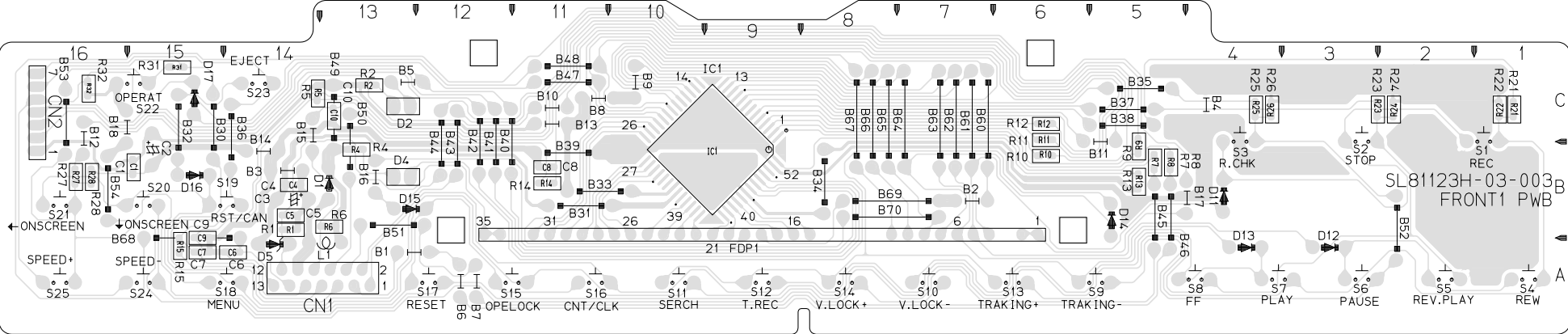


IC601 6A	R8 3B	R623 5B	R646 6C	C2 2A	C623 5C	CN4 5A	B16 6A	B206 3A	B316 5A
IC602 6A	R601 6A	R624 5B	R647 6C	C601 7B	C624 6C	CN5 7A	B17 7A	B207 4A	B317 6A
IC603 5B	R602 6B	R625 7B	R648 6C	C602 6B	C625 5C	CN6 1B	B18 7B	B208 6C	B318 7A
IC604 5C	R603 6B	R626 7A	R649 6C	C603 6A	C626 6C	CN7 6A	B19 7A	B209 6C	B319 7A
IC605 6C	R604 6A	R627 7A	R650 6C	C604 6A	C627 4A		B20 8A	B210 7B	
IC606 5C	R605 6B	R628 7A	R651 6C	C605 6A	C628 6C	PS1 6B	B101 2D	B211 5A	S1 7D
IC607 5B	R606 6A	R629 5C	R652 6C	C606 6A	C629 6C	PS2 3B	B102 2C	B212 5A	S2 2D
IC608 5C	R607 6A	R630 6A	R653 6C	C607 6A	C630 7A		B103 2C	B213 5A	S3 2C
IC609 5C	R608 6A	R631 5B	R654 6C	C608 6A		B1 5D	B104 3D	B301 5C	
IC610 5C	R609 6A	R632 6B	R655 5C	C609 6A		B2 7C	B105 3C	B302 6C	
	R610 6A	R633 5B	R656 7A	C610 5A		B3 5C	B106 3A	B303 5C	
	R611 6B	R634 6B	R657 7A	C611 5B		B4 5C	B107 5C	B304 5B	
Q1 8A	R612 6A	R635 6C	R658 7A	C612 5B		B5 5B	B108 5C	B305 5C	
Q2 1A	R613 6A	R636 6D	R659 7A	C613 5C		B6 6C	B109 6D	B306 6C	
	R614 5B	R637 6D	R660 7A	C614 5B		B7 6C	B110 5C	B307 6B	
	R615 6A	R638 6B		C615 6B		B8 4B	B111 5A	B308 5B	
R1 8A	R616 6A	R639 6B	VR601 7B	C616 5B		B9 5B	B112 5A	B309 5B	
R2 7A	R617 6A	R640 6B	VR602 7A	C617 6B		B10 5B	B113 6B	B310 5B	
R3 2A	R618 5B	R641 6C	VR603 6C	C618 6B		B11 6B	B201 3C	B311 5B	
R4 2A	R619 5B	R642 6C	VR604 6C	C619 6C		B12 6B	B202 3B	B312 5B	
R5 4A	R620 5B	R643 5C	VR605 6C	C620 5B		B13 7B	B203 3B	B313 5B	
R6 4A	R621 5B	R644 6C		C621 6C		B14 7B	B204 3A	B314 6B	
R7 7B	R622 5B	R645 6C		C622 5C		B15 6A	B205 4A	B315 6B	

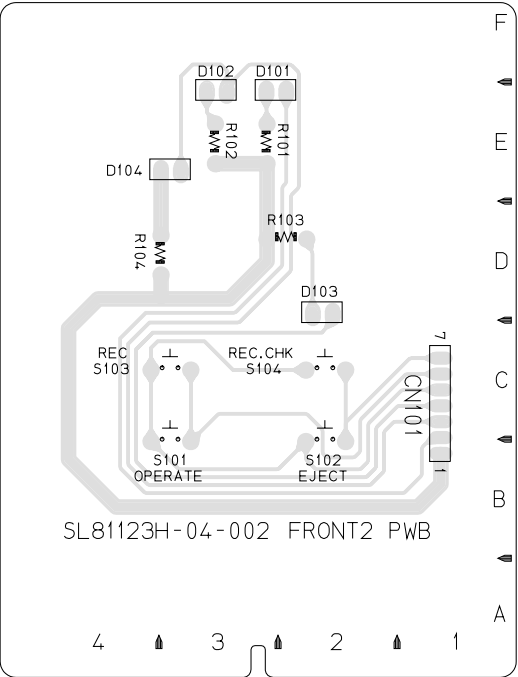
4.9 FRONT1,2 BOARD SCHEMATIC DIAGRAM



4.10 FRONT1 CIRCUIT BOARD




4.11 FRONT2 CIRCUIT BOARD




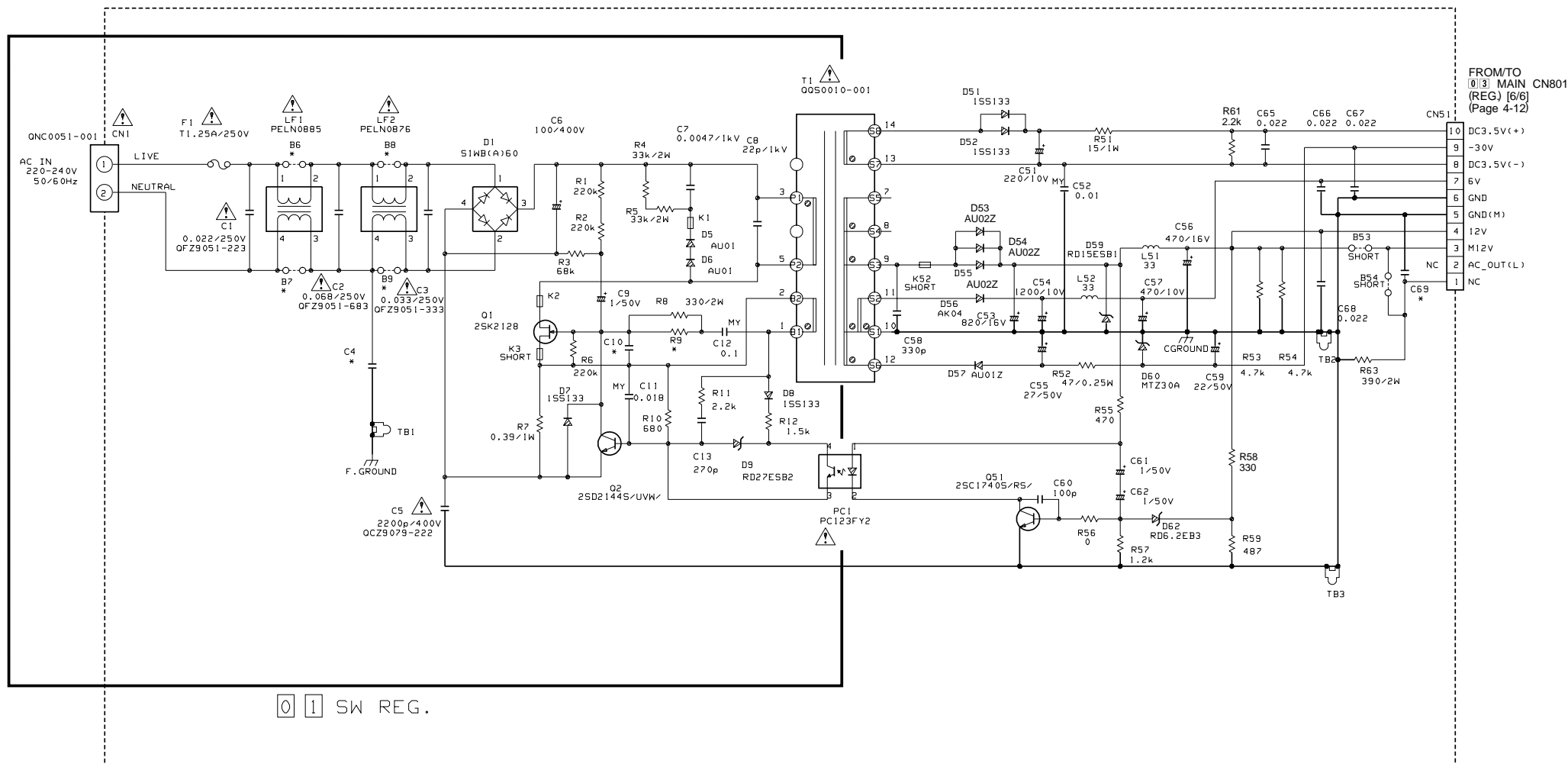
4.12 SW REG. BOARD SCHEMATIC DIAGRAM

CAUTION

THE  MARK INDICATES THE PRIMARY CIRCUIT TO DISTINGUISH THE PRIMARY FROM THE SECONDARY CIRCUIT.
PAY ATTENTION NOT TO RECEIVE AN ELECTRIC SHOCK DURING REPAIR AND SERVICE OF THE PRODUCTS.

IMPORTANT SAFETY NOTICE:


COMPONENTS IDENTIFIED WITH THE MARK  HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SAME TYPE.




* : OPEN

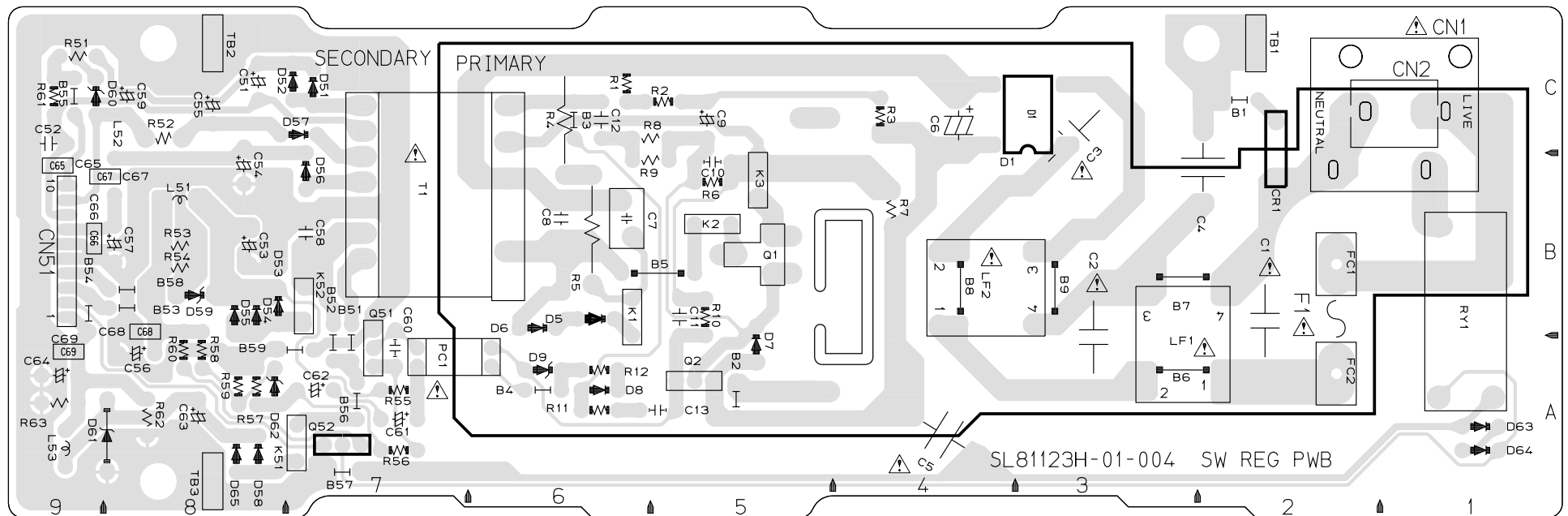
93096

CAUTION

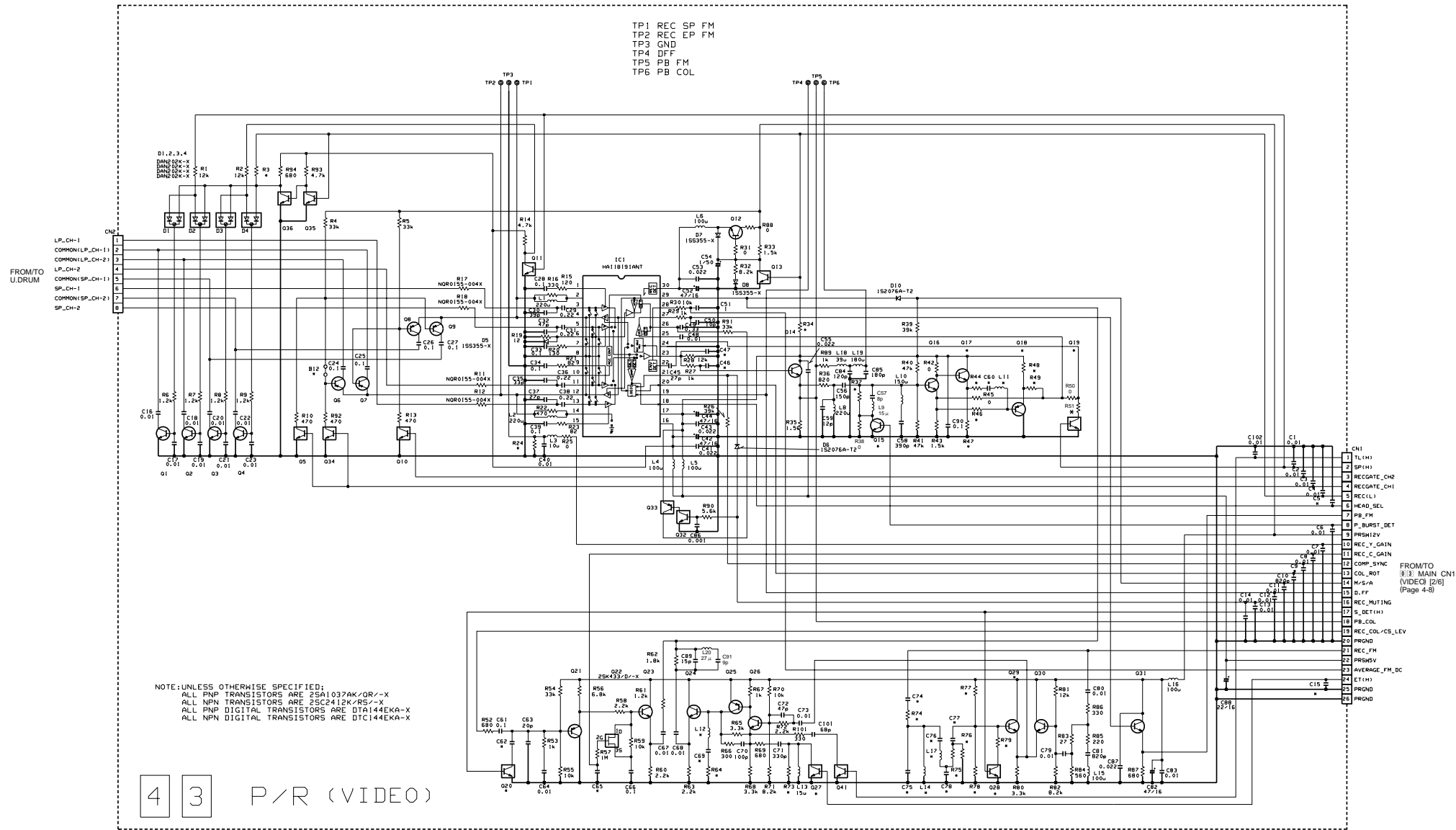
THE  MARK INDICATES THE PRIMARY CIRCUIT TO DISTINGUISH THE PRIMARY FROM THE SECONDARY CIRCUIT.
PAY ATTENTION NOT TO RECEIVE AN ELECTRIC SHOCK DURING REPAIR AND SERVICE OF THE PRODUCTS.

IMPORTANT SAFETY NOTICE:

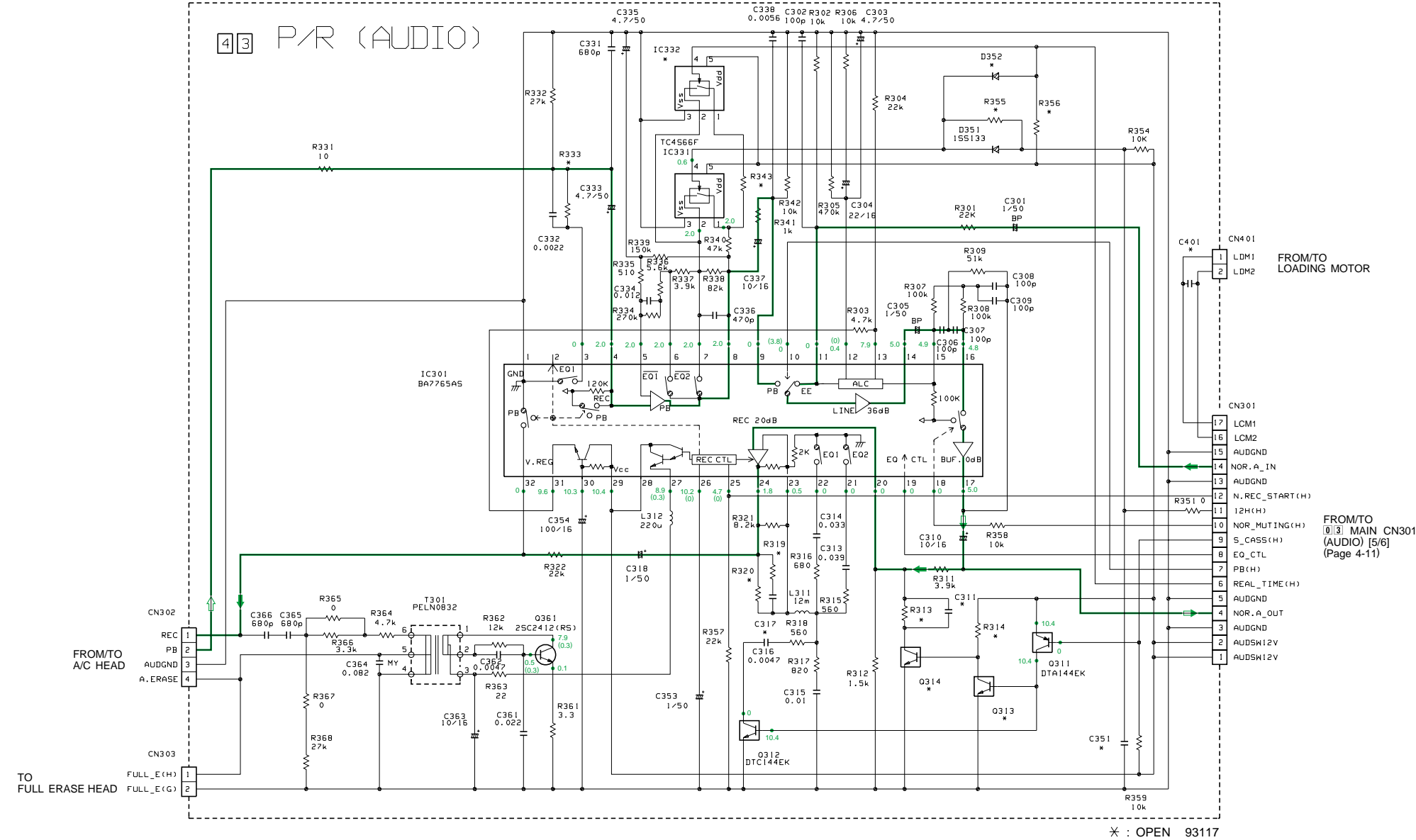
COMPONENTS IDENTIFIED WITH THE MARK  HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SAME TYPE.

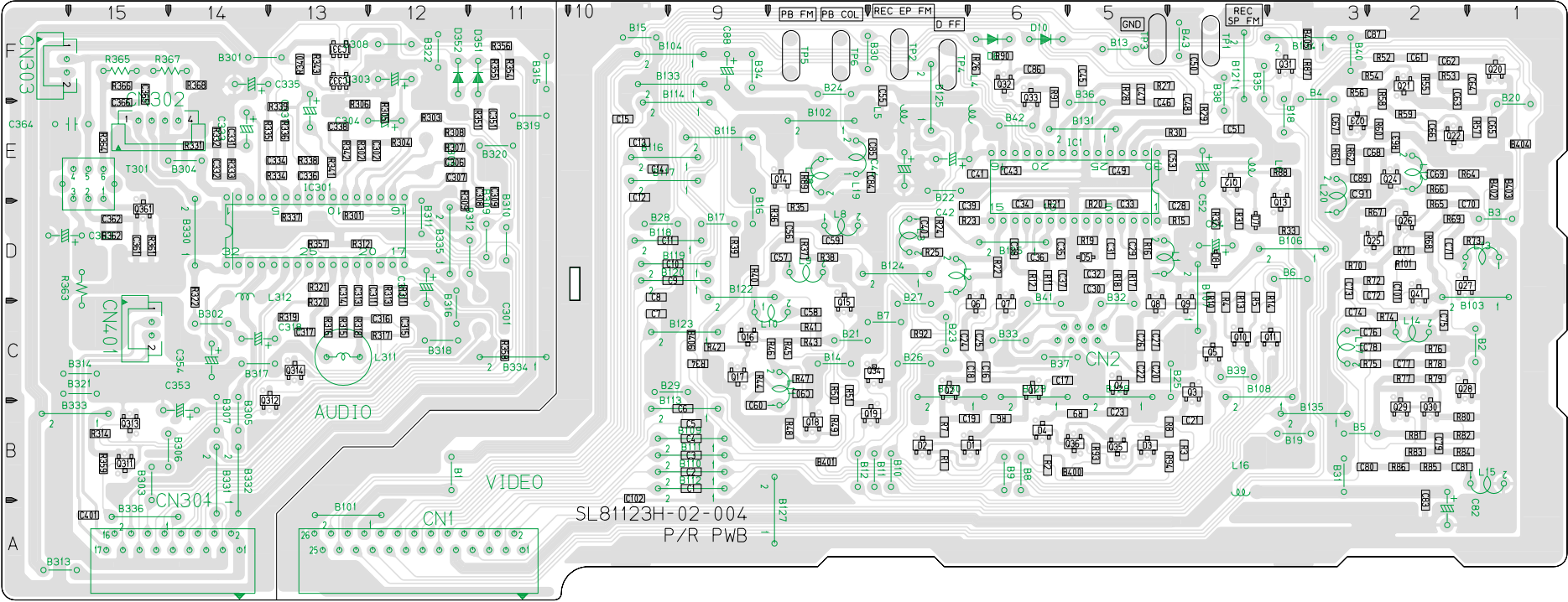


4.14 P/R BOARD SCHEMATIC DIAGRAMS [1/2]
4.14.1 VIDEO

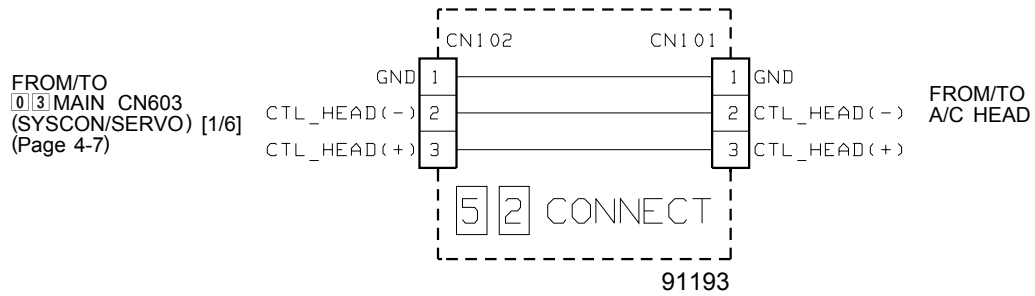


4.14 P/R BOARD SCHEMATIC DIAGRAMS [2/2]
4.14.2 AUDIO

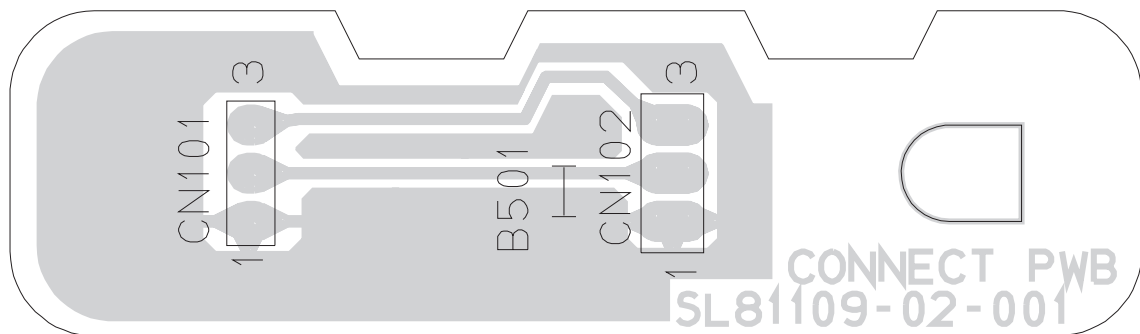




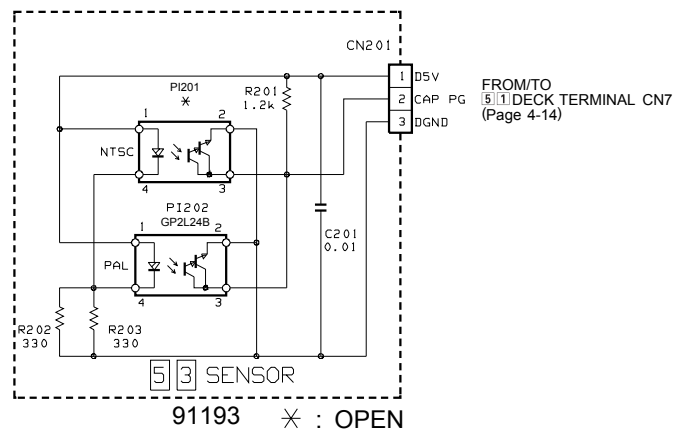
4.16 CONNECT BOARD SCHEMATIC DIAGRAM



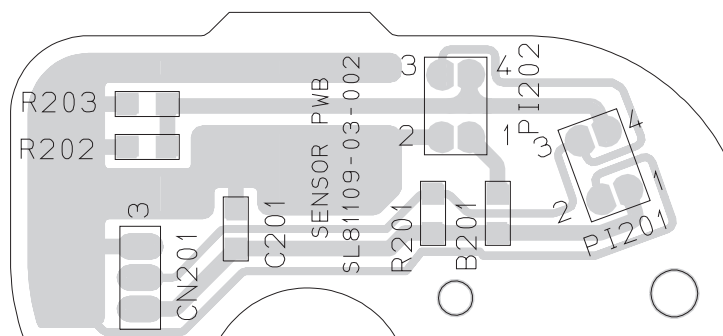
4.17 CONNECT CIRCUIT BOARD



4.18 SENSOR BOARD SCHEMATIC DIAGRAM



4.19 SENSOR CIRCUIT BOARD





Memo

SECTION 5

EXPLODED VIEWS & REPLACEMENT PARTS LIST

Note:


1. *Be sure to make your orders of replacement parts according to this list.
2. Unless otherwise specified, all resistors are in OHMS, K=1,000 OHMS, all capacitors are in MICROFARADS (μ F), P= μ F.
3. The P.C. Board untils marked with "■" shown below the main assembled parts.
4. The parts marked with  on the exploded view show the electric parts.
5. IMPORTANT SAFETY NOTICE
Components identified with the mark  have the special characteristics for safety. When replacing any of these components, use only the same type.
6. The marking (RTL) indicates the retention time is limited for this item.
After the diacontinuation of this assembly in production, it will no longer be available.

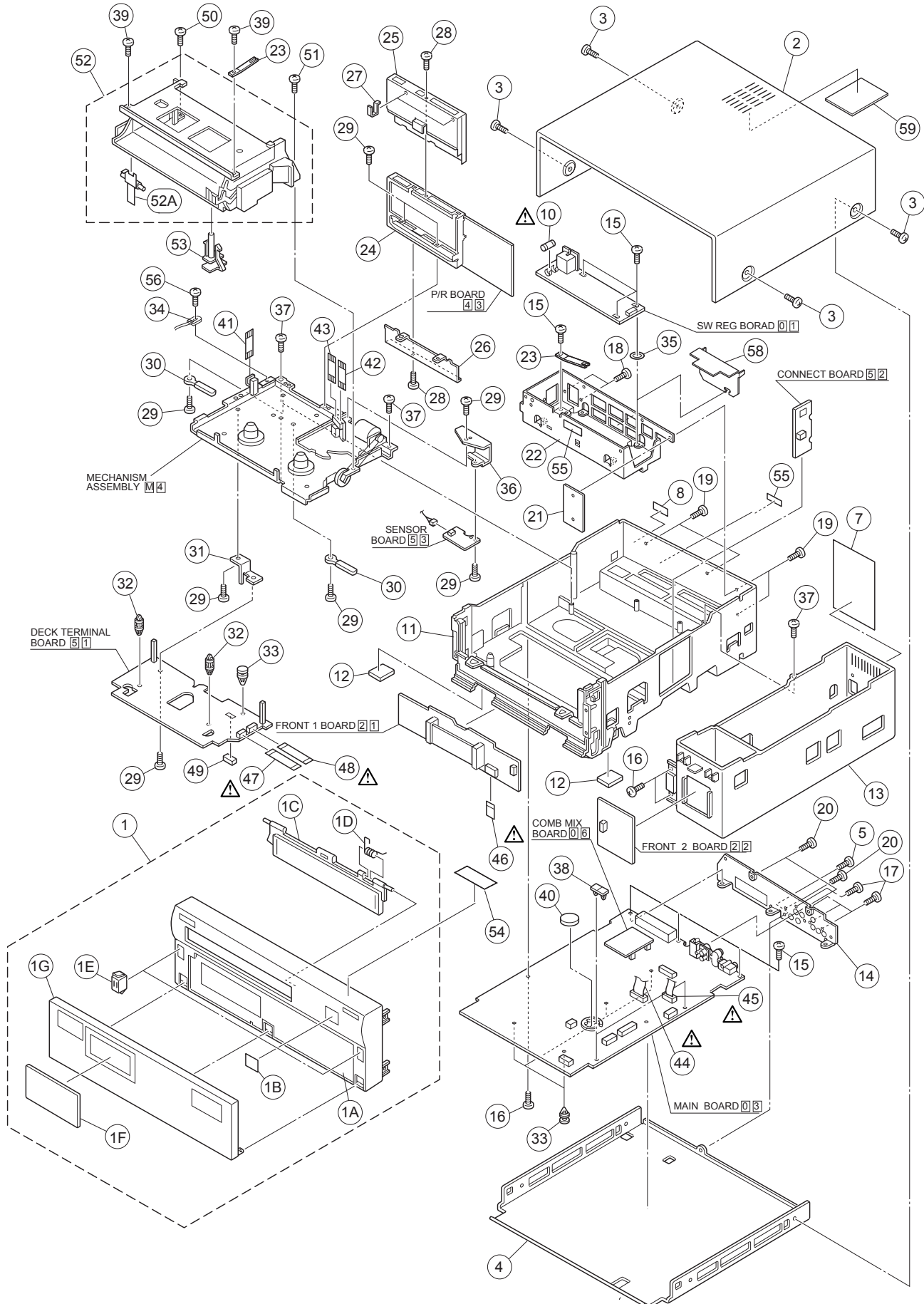
SERVICING FIXTURES & TOOLS


[illegible]

5.1 CABINET & CHASSIS ASSEMBLY

M 2

Components identified with the mark  have the special characteristics for safety. When replacing any of these components, use only the same type.




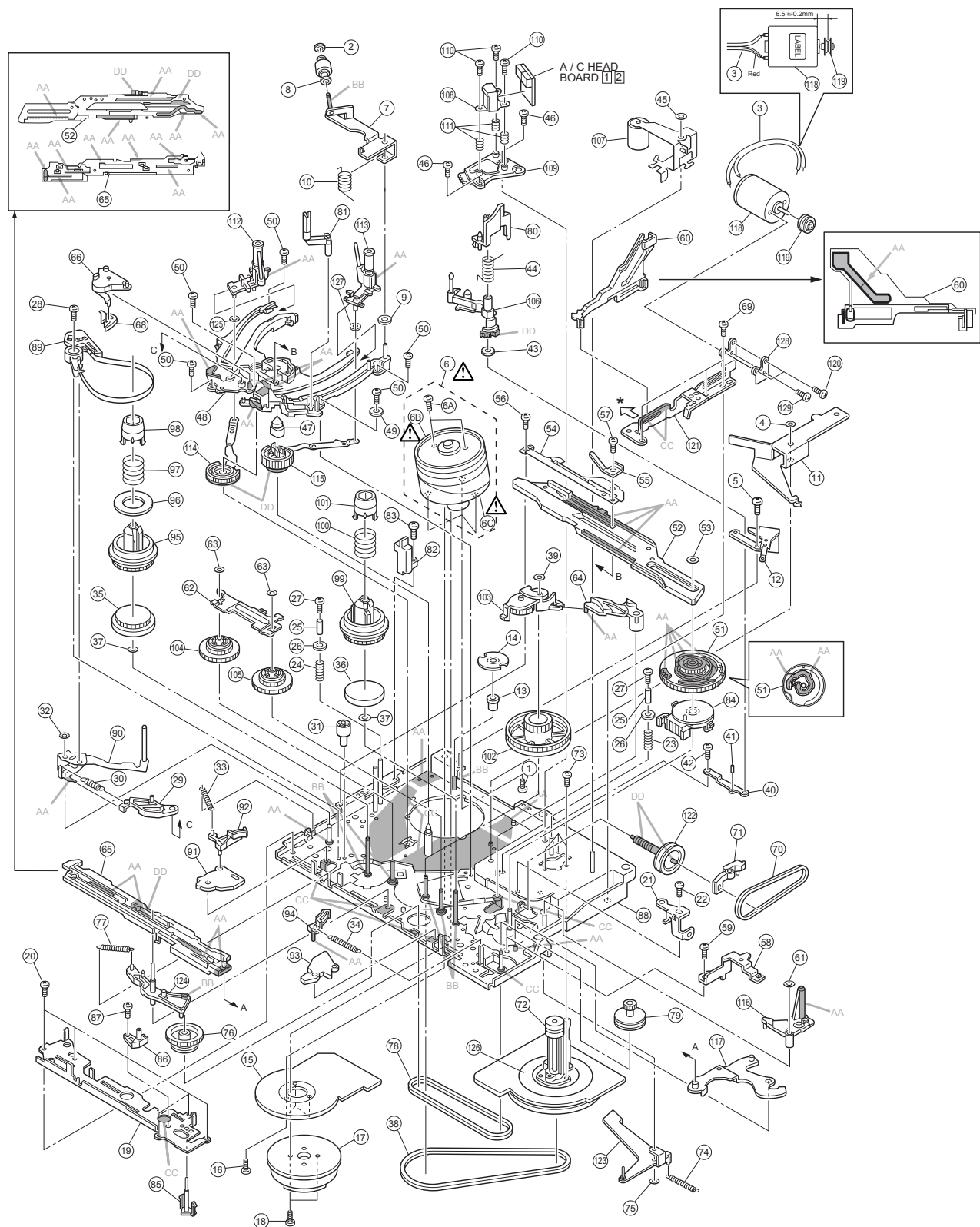
Components identified with the mark  have the special characteristics for safety. When replacing any of these components, use only the same type.

[illegible][illegible]

5.2 MECHANISM ASSEMBLY

M 4

Components identified with the mark  have the special characteristics for safety. When replacing any of these components, use only the same type.



NOTE : The section marked in AA, BB, CC and DD indicate lubrication and greasing areas.
* When installing the No. 121 guide bracket, draw up to the direction by the arrow.


Category	Part No.	MARK
Grease	VFK1748	AA
	VFK1750	DD
	VFK1749	CC
Oil	VFK1751	BB

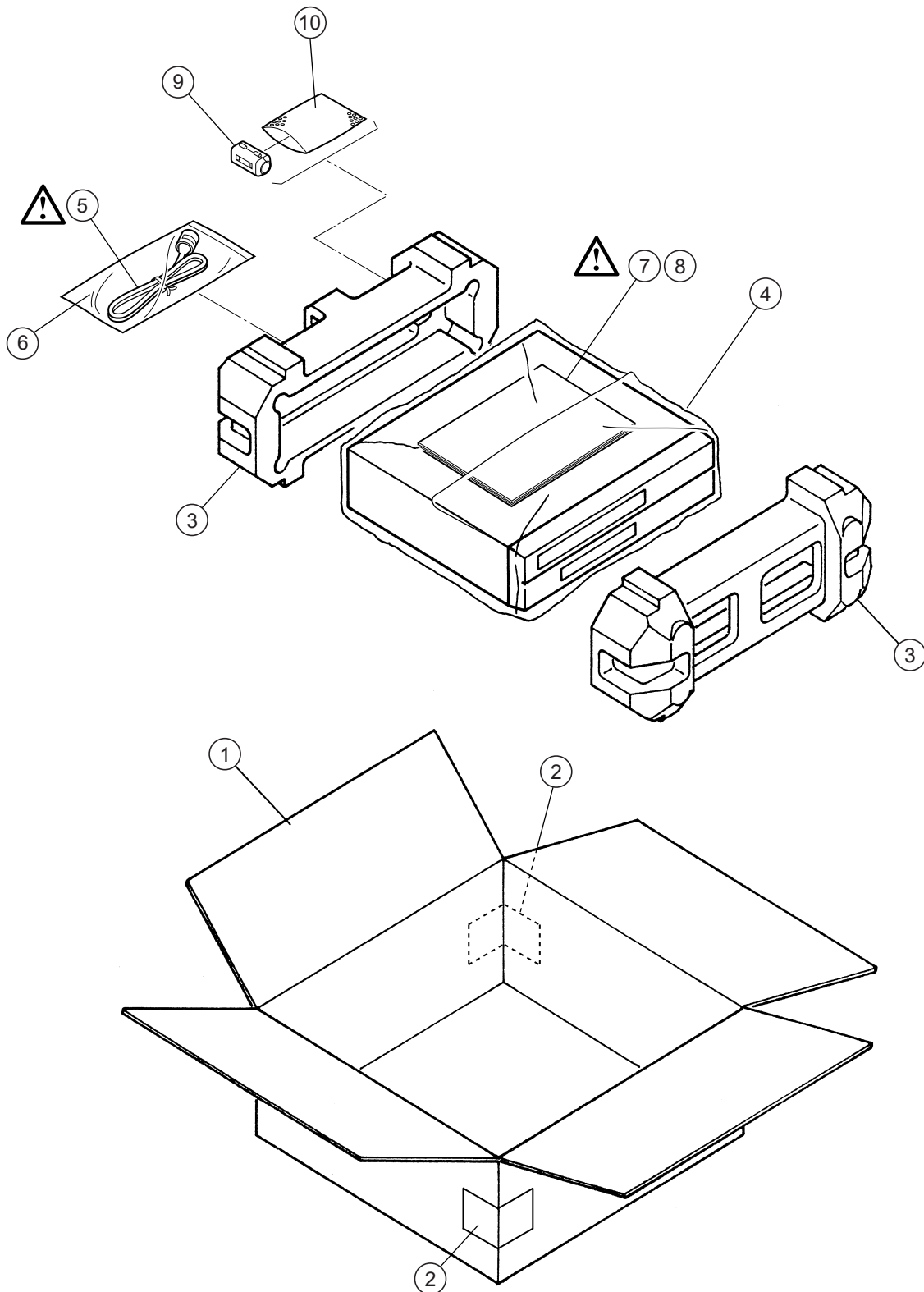
When replacing any of these components, use only the same type


Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
1	QYSPSP2606Z	SCREW	1	M2.6X6
2	PQM30017-25	SLIT WASHER	1	
3	3010180AJ632	WIRE	1	
4	PQM30017-31	SLIT WASHER	1	
5	QYSDST2606Z	SCREW	1	M2.6X6
△ 6	PDR2024B	DRUM ASS'Y	1	
6A	PDM4165A	SCREW	1	
△ 6B	PRD20614F	UPPER DRUM ASS'Y	1	
△ 6C	PRD20619B	LOWER DRUM ASS'Y	1	
7	PRD45283A	H.C.ARM ASS'Y	1	
8	PQ46417A-2	ROLLER ASS'Y	1	
9	QYWFM315425	WASHER	1	
10	PRD45079	TORSION SPRING	1	
11	PRD31301	RELEASE ARM	1	
12	PRD45297A	BRUSH ASS'Y	1	
13	PRD45276A	ROLLER ASS'Y	1	
14	PRD45275	INERTIA PLATE	1	
15	PGZ02610	STATOR ASS'Y	1	
16	QYSPSPU17C02	SCREW	1	M1.7X12
17	PDZ0097-2	ROTOR ASS'Y	1	
18	QYSPSP2608N	SCREW	1	M2.6X8
19	PRD20625	MAIN PLATE	1	
20	QYSPST2606Z	SCREW	5	M2.6X6
21	PRD45055	W. GEAR BRACKET	1	
22	QYSDSP2606Z	SCREW	1	M2.6X6
23	PRD30023-62	COMP. SPRING 62	1	
24	PRD30023-63	COMP. SPRING 63	1	
25	PRD45080	TAPE GUIDE	2	
26	PRD45081	GUIDE FLANGE	2	
27	PRD43165	SCREW	2	M2X6
28	QYSDSP2606Z	SCREW	1	M2.6X6
29	PQ35012-1-5	T. ARM LEVER	1	
30	PRD30024-108	TEN. SPRING 109	1	
31	PQ46302-1-3	ADJUST PIN	1	
32	PQM30017-47	SLIT WASHER	1	
33	PQM30001-393	TEN. SPRING 393	1	
34	30001-389102	TEN. SPRING 102	1	
35	PQ35436	SLIT DISK (S)	1	
36	PQ35437	SLIT DISK (T)	1	
37	PQM30018-69	SPACER	2	
38	PQM30003-38	BELT (CAPSTAN)	1	
39	QYWFM214025	WASHER	1	
40	PRD45056	HEIGHT PLATE	1	
41	QYYASPF2005F	SCREW	1	M2X5
42	QYSPST2606Z	SCREW	1	M2.6X6
43	QYWFM315425	WASHER	1	
44	PQ46326-2	TOR. SPRING 2	1	
45	PQM30017-24	SLIT WASHER	1	
46	QYSDSP2606Z	SCREW	2	M2.6X6
47	PQ46767-1-2	GUIDE CAP	1	
48	PQ11657-1-9	GUIDE RAIL	1	
49	LP40005-001A	SPACER	1	
50	QYSPST2608Z	SCREW	5	M2.6X8
51	PQ21684-1-3	CONTROL CAM	1	
52	PQ11658-1-15	CONTROL PLATE	1	
53	PQM30017-8	SLIT WASHER	1	
54	PQ35138-2	CONTROL BRACKET	1	
55	PQ46423	EARTH PLATE	1	
56	QYSPST2606Z	SCREW	1	M2.6X6
57	QYSPSF2608M	SCREW	1	M2.6X8
58	PQ35217-1-2	CTL BRACKET 2	1	
59	QYSPST2606Z	SCREW	1	M2.6X6
60	PQ21685-2-10	PINCH R. PLATE	1	
61	PQM30017-8	SLIT WASHER	1	
62	PQ35083-2	REEL BRACKET	1	
63	PQM30017-51	SLIT WASHER	2	
64	PQ35026-1-7	IDLER LEVER	1	
65	PQ11659-2	SLIDE PLATE	1	
66	PQ21686-1-3	T-UP LEVER	1	
68	PQ46345-1-2	T-UP HEAD	1	
69	QYSPST2606Z	SCREW	1	M2.6X6
70	PQM30003-39	BELT (LOADING)	1	
71	PQ21699-1-2	WORM BEARING	1	
72	PGS30512A-01	CAPSTAN MOTOR ASS'Y	1	

[illegible]

5.3 PACKING ASSEMBLY

Components identified with the mark  have the special characteristics for safety. When replacing any of these components, use only the same type.



Components identified with the mark  have the special characteristics for safety. When replacing any of these components, use only the same type.

[illegible][illegible]

ELECTRICAL REPLACEMENT PARTS LIST


Components identified with the mark have the special characteristics for safety. When replacing any of these components, use only the same type.

[illegible]




Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
FC1,C2	QNG0037-001Z	FUSE HOLDER	2	
K1,K2	QQR0601-001Z	FERRITE BEAD	2	
L51,52	PELN0696-330	COIL 33UH	2	
⚠ LF1	PELN0885	LINE FILTER	1	
⚠ LF2	PELN0876	LINE FILTER	1	
PC1	PC123FY2	IC	1	B3PAA0000012
Q1	2SK212800SLT	FET	1	
Q2	D2144S/UWV/	TRANSISTOR	1	
Q51	2SC1740S	TRANSISTOR	1	
R1,R2	QRE141J-224Y	C.RESISTOR 1/4W 220K	2	
R3	QRE141J-683Y	C.RESISTOR 1/4W 68K	1	
R4,R5	QRL027J-333	M.RESISTOR 2W 33K	2	
R6	QRE141J-224Y	C.RESISTOR 1/4W 220K	1	
R7	QRT01DJ-R39X	M.RESISTOR 1W 0.39	1	
R8	QRG02DJ-331X	M.RESISTOR 2W 330	1	
R10	QRE141J-681Y	C.RESISTOR 1/4W 680	1	
R11	QRE141J-222Y	C.RESISTOR 1/4W 2.2K	1	
R12	QRE141J-152Y	C.RESISTOR 1/4W 1.5K	1	
R51	QRG01DJ-150X	M.RESISTOR 1W 15	1	
R52	QRZ9005-470X	F.RESISTOR 47	1	
R53,54	QRE141J-472Y	C.RESISTOR 1/4W 4.7K	2	
R55	QRE141J-471Y	C.RESISTOR 1/4W 470	1	
R56	QRE141J-0R0Y	C.RESISTOR 1/4W 0	1	
R57	QRE141J-122Y	C.RESISTOR 1/4W 1.2K	1	
R58	QRA14CF-3300	M.RESISTOR 1/4W 330	1	
R59	QRA14CF-4870	M.RESISTOR 1/4W 487	1	
R61	QRE141J-222Y	C.RESISTOR 1/4W 2.2K	1	
R63	QRG02DJ-391X	M.RESISTOR 2W 390	1	
⚠ T1	QQS0010-001	SWITCH TRANSFORMER	1	
TB1	SQMX002-001Z	TERMINAL	1	
		MISCELLANEOUS		
	PGD40689	HEAT SINK	1	
	QYSDSP3008Z	SCREW	1	
■ E2	SLK1124-E0C	MAIN C.B.A.	1 (RTL)	
B701	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
BT601	QNZ0149-001	LI BATT HOLDER	1	
BZ601	QAN0023-001Z	BUZZER	1	
C1	NCB21EK-104X	C.CAPACITOR 25V 0.1U	1	
C3	QEDC1HM-105Z	E.CAPACITOR 50V 1M	1	
C4	NCB21EK-563X	C.CAPACITOR 25V 0.056U	1	
C5	NCB21HK-223X	C.CAPACITOR 50V 0.022U	1	
C6	QEDC1HM-475Z	E.CAPACITOR 50V 4.7M	1	
C7	QEDC1HM-225Z	E.CAPACITOR 50V 2.2M	1	
C8,C9	NCB21EK-104X	C.CAPACITOR 25V 0.1U	2	
C10	QEDC1CM-106Z	E.CAPACITOR 16V 10M	1	
C11	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C12	NDC21HJ-101X	C.CAPACITOR 50V 100P	1	
C13	NDC21HJ-1R0X	C.CAPACITOR 50V 1P	1	
C14	NDC21HJ-300X	C.CAPACITOR 50V 30P	1	
C15	NCB21HK-473X	C.CAPACITOR 50V 0.047U	1	
C18	QEDC1HM-105Z	E.CAPACITOR 50V 1M	1	
C19	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C20	NDC21HJ-101X	C.CAPACITOR 50V 100P	1	
C22-24	QEDC1HM-474Z	E.CAPACITOR 50V 0.47M	3	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
C25	NDC21HJ-470X	C.CAPACITOR 50V 47P	1	
C26,27	NCB21HK-103X	C.CAPACITOR 50V 0.01U	2	
C28	QEDC1HM-225Z	E.CAPACITOR 50V 2.2M	1	
C29	QEDC1CM-226Z	E.CAPACITOR 16V 22M	1	
C30	QEDC1HM-225Z	E.CAPACITOR 50V 2.2M	1	
C31	NDC21HJ-270X	C.CAPACITOR 50V 27P	1	
C32	QEDC1CM-226Z	E.CAPACITOR 16V 22M	1	
C33,34	NCB21HK-473X	C.CAPACITOR 50V 0.047U	2	
C35	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C36-38	QEDC1CM-106Z	E.CAPACITOR 16V 10M	3	
C39	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C40	QEDC1HM-474Z	E.CAPACITOR 50V 0.47U	1	
C41	QEDC1HM-104Z	E.CAPACITOR 50V 0.1U	1	
C42	QEDC1HM-474Z	E.CAPACITOR 50V 0.47U	1	
C43,44	NCB21HK-103X	C.CAPACITOR 50V 0.01U	2	
C45	NDC21HJ-680X	C.CAPACITOR 50V 68P	1	
C47	QEDC1HM-104Z	E.CAPACITOR 50V 0.1U	1	
C48	NDC21HJ-331X	C.CAPACITOR 50V 330P	1	
C49	NDC21HJ-820X	C.CAPACITOR 50V 82P	1	
C52	NDC21HJ-101X	C.CAPACITOR 50V 100P	1	
C53	NDC21HJ-330X	C.CAPACITOR 50V 33P	1	
C54	NCB21AK-105X	C.CAPACITOR 10V 1U	1	
C55	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C56	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C57,58	NCB21HK-103X	C.CAPACITOR 50V 0.01U	2	
C60	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C61	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C62-64	NCB21HK-103X	C.CAPACITOR 50V 0.01U	3	
C65	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C66	NDC21HJ-680X	C.CAPACITOR 50V 68P	1	
C67	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C70	NDC21HJ-220X	C.CAPACITOR 50V 22P	1	
C72	NDC21HJ-390X	C.CAPACITOR 50V 39P	1	
C73	NDC21HJ-150X	C.CAPACITOR 50V 15P	1	
C74	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C78	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C79	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C80	QEDC1HM-475Z	E.CAPACITOR 50V 4.7M	1	
C81,82	QEDC1HM-225Z	E.CAPACITOR 50V 2.2M	2	
C83	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C84,85	NDC21HJ-301X	C.CAPACITOR 50V 300P	2	
C86	NDC21HJ-221X	C.CAPACITOR 50V 220P	1	
C87	NDC21HJ-820X	C.CAPACITOR 50V 82P	1	
C88	NDC21HJ-271X	C.CAPACITOR 50V 270P	1	
C89	NDC21HJ-470X	C.CAPACITOR 50V 47P	1	
C90	NDC21HJ-181X	C.CAPACITOR 50V 180P	1	
C91	NDC21HJ-301X	C.CAPACITOR 50V 300P	1	
C92	NDC21HJ-271X	C.CAPACITOR 50V 270P	1	
C93	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C94	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C95	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
C96	NDC21HJ-121X	C.CAPACITOR 50V 120P	1	
C97	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C99	NCB21HK-223X	C.CAPACITOR 50V 0.022U	1	
C100	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C101	QEDC1HM-105Z	E.CAPACITOR 50V 1M	1	
C102	QEDC1CM-106Z	E.CAPACITOR 16V 10M	1	
C103,04	NCB21HK-103X	C.CAPACITOR 50V 0.01U	2	
C105	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C106	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C107,08	NDC21HJ-100X	C.CAPACITOR 50V 10P	2	
C109	NCB21HK-223X	C.CAPACITOR 50V 0.022U	1	
C110	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C111	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C112	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C113	NDC21HJ-271X	C.CAPACITOR 50V 270P	1	
C115	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C120	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C121	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C122	QEDC1HM-104Z	E.CAPACITOR 50V 0.1M	1	
C123	NDC21HJ-330X	C.CAPACITOR 50V 33P	1	
C124-27	NCB21EK-104X	C.CAPACITOR 25V 0.1U	4	
C128	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C129	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C140	QTNC1CM-106Z	E.CAPACITOR 16V 10M	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
C141	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C142	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C143	NDC21HJ-120X	C.CAPACITOR 50V 12P	1	
C144	NDC21HJ-121X	C.CAPACITOR 50V 120P	1	
C146	NDC21HJ-150X	C.CAPACITOR 50V 15P	1	
C147	NDC21HJ-470X	C.CAPACITOR 50V 47P	1	
C149	NCB21HK-103X	C.CAPACITOR 50V 0.1U	1	
C150	NDC21HJ-120X	C.CAPACITOR 50V 12P	1	
C151	NDC21HJ-180X	C.CAPACITOR 50V 18P	1	
C152	NDC21HJ-121X	C.CAPACITOR 50V 120P	1	
C154	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C155	NDC21HJ-560X	C.CAPACITOR 50V 56P	1	
C157	NDC21HJ-471X	C.CAPACITOR 50V 470P	1	
C158-60	NCB21HK-103X	C.CAPACITOR 50V 0.01U	3	
C161,62	QEHR1AM-108Z	E.CAPACITOR 10V 1000M	2	
C163	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C164	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C165	QTMC1CM-476Z	E.CAPACITOR 16V 47M	1	
C166	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C168,69	QEDC1CM-476Z	E.CAPACITOR 16V 47M	2	
C170,71	NCB21HK-103X	C.CAPACITOR 50V 0.01U	2	
C172	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C173	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C174	QEDC1HM-105Z	E.CAPACITOR 50V 1M	1	
C175	QTP61HM-105Z	E.CAPACITOR 50V 1M	1	
C177	QTP61HM-105Z	E.CAPACITOR 50V 1M	1	
C178	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C179	NDC21HJ-9R0X	C.CAPACITOR 50V 9P	1	
C181	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C182	NDC21HJ-390X	C.CAPACITOR 50V 39P	1	
C184	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C185	NDC21HJ-470X	C.CAPACITOR 50V 47P	1	
C186,87	NCB21HK-103X	C.CAPACITOR 50V 0.01U	2	
C188	NDC21HJ-470X	C.CAPACITOR 50V 47P	1	
C190	NDC21HJ-220X	C.CAPACITOR 50V 22P	1	
C191	NDC21HJ-150X	C.CAPACITOR 50V 15P	1	
C192	NDC21HJ-240X	C.CAPACITOR 50V 24P	1	
C193	NDC21HJ-220X	C.CAPACITOR 50V 22P	1	
C194	NDC21HJ-390X	C.CAPACITOR 50V 39P	1	
C195	NDC21HJ-150X	C.CAPACITOR 50V 15P	1	
C196	NDC21HJ-120X	C.CAPACITOR 50V 12P	1	
C197	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C198	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C199	NDC21HJ-101X	C.CAPACITOR 50V 100P	1	
C200	NDC21HJ-270X	C.CAPACITOR 50V 27P	1	
C201	NDC21HJ-470X	C.CAPACITOR 50V 47P	1	
C203	NDC21HJ-390X	C.CAPACITOR 50V 39P	1	
C204,05	NDC21HJ-180X	C.CAPACITOR 50V 18P	2	
C206,07	NCB21HK-103X	C.CAPACITOR 50V 0.01U	2	
C208	NDC21HJ-820X	C.CAPACITOR 50V 82P	1	
C209,10	QEDC1CM-476Z	E.CAPACITOR 16V 47M	2	
C212	NDC21HJ-391X	C.CAPACITOR 50V 390P	1	
C213	NDC21HJ-560X	C.CAPACITOR 50V 56P	1	
C214	NDC21HJ-331X	C.CAPACITOR 50V 330P	1	
C215	NDC21HJ-121X	C.CAPACITOR 50V 120P	1	
C216	NDC21HJ-560X	C.CAPACITOR 50V 56P	1	
C217	QEDC1HM-105Z	E.CAPACITOR 50 1M	1	
C218	NDC21HJ-151X	C.CAPACITOR 50V 150P	1	
C220	NDC21HJ-561X	C.CAPACITOR 50V 560P	1	
C221	NCB21HK-102X	C.CAPACITOR 50V 1000P	1	
C222-24	NCB21HK-103X	C.CAPACITOR 50V 0.01U	3	
C225	NDC21HJ-560X	C.CAPACITOR 50V 56P	1	
C227	NDC21HJ-100X	C.CAPACITOR 50V 10P	1	
C228	NDC21HJ-330X	C.CAPACITOR 50V 33P	1	
C231	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C232	NCB21EK-104X	C.CAPACITOR 25V 0.1U	1	
C233	NDC21HJ-7R0X	C.CAPACITOR 50V 7P	1	
C234	NDC21HJ-240X	C.CAPACITOR 50V 24P	1	
C235	NDC21HJ-470X	C.CAPACITOR 50V 47P	1	
C236,37	NCB21HK-103X	C.CAPACITOR 50V 0.01U	2	
C238	NDC21HJ-101X	C.CAPACITOR 50V 100P	1	
C251	NDC21HJ-270X	C.CAPACITOR 50V 27P	1	
C252	NDC21HJ-821X	C.CAPACITOR 50V 820P	1	
C253	NCB21HK-473X	C.CAPACITOR 50V 0.047P	1	
C254	NDC21HJ-120X	C.CAPACITOR 50V 12P	1	

Components identified with the mark  have the special characteristics for safety.
When replacing any of these components, use only the same type.

R5				
C256	NDC21HJ-220X	C.CAPACITOR 50V 22P	1	
C263	NDC21HJ-150X	C.CAPACITOR 50V 15P	1	
C264	NCB21EK-104X	C.CAPACITOR 25V 0.1U	1	
C267	NCB21EK-104X	C.CAPACITOR 25V 0.1U	1	
C270	NDC21HJ-331X	C.CAPACITOR 50V 330P	1	
C302	NCB21HK-102X	C.CAPACITOR 50V 1000P	1	
C303	NDC21HJ-100X	C.CAPACITOR 50V 10P	1	
C304	QEDC1HM-475Z	E.CAPACITOR 50V 4.7M	1	
C307	QEDC1CM-476Z	E.CAPACITOR 50V 47M	1	
C308	QEK1CM-227Z	E.CAPACITOR 50V 220M	1	
C309	NCB21EK-104X	C.CAPACITOR 25V 0.1U	1	
C312	NCB21HK-682X	C.CAPACITOR 50V 6800P	1	
C313	NDC21HJ-101X	C.CAPACITOR 50V 100P	1	
C314	QEDC1HM-475Z	E.CAPACITOR 50V 4.7M	1	
C316	QEDC1CM-106Z	E.CAPACITOR 50V 10M	1	
C321	QEDC1CM-476Z	E.CAPACITOR 50V 47M	1	
C322	NCB21EK-104X	C.CAPACITOR 25V 0.1U	1	
C352	NCB21HK-472X	C.CAPACITOR 50V 4700P	1	
C360	NCB21EK-104X	C.CAPACITOR 25V 0.1U	1	
C362	NCB21HK-102X	C.CAPACITOR 50V 1000P	1	
C601	NDC21HJ-150X	C.CAPACITOR 50V 15P	1	
C602	NDC21HJ-120X	C.CAPACITOR 50V 12P	1	
C603	NDC21HJ-100X	C.CAPACITOR 50V 10P	1	
C604	NCB21EK-104X	C.CAPACITOR 25V 0.1U	1	
C605	NCB21HK-223X	C.CAPACITOR 50V 0.022U	1	
C606,07	NCB21HK-103X	C.CAPACITOR 50V 0.01U	2	
C608	QEGR1CM-476Z	E.CAPACITOR 16V 47M	1	
C609-13	NCB21HK-103X	C.CAPACITOR 50V 0.01U	5	
C614	QEHCOJM-337Z	E.CAPACITOR 6.3V 330M	1	
C615	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C616	QEDC1CM-226Z	E.CAPACITOR 16V 22M	1	
C617	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C618	QEDC1CM-226Z	E.CAPACITOR 16V 22M	1	
C621	NCB21HK-473X	C.CAPACITOR 50V 0.047U	1	
C623,24	NDC21HJ-221X	C.CAPACITOR 50V 220P	2	
C625	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C626	QEK1CM-107Z	E.CAPACITOR 16V 100M	1	
C627	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C628	QEDC1AM-336Z	E.CAPACITOR 10V 33M	1	
C629	QEDC1CM-226Z	E.CAPACITOR 16V 22M	1	
C630	QEK1CM-107Z	E.CAPACITOR 16V 100M	1	
C632	QEDC1HM-105Z	E.CAPACITOR 50V 1M	1	
C633	NCB21HK-102X	C.CAPACITOR 50V 1000P	1	
C634	QEP61HM-105Z	E.CAPACITOR 50V 1M	1	
C635	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C636	NCB21HK-222X	C.CAPACITOR 50V 2200P	1	
C637	QEK1CM-107Z	E.CAPACITOR 16V 100M	1	
C638	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C640	QEP61HM-105Z	E.CAPACITOR 50V 1M	1	
C641	QEP61CM-106Z	E.CAPACITOR 16V 10M	1	
C656	NCB21EK-104X	C.CAPACITOR 25V 0.1U	1	
C657	NCB21CK-154X	C.CAPACITOR 16V 0.15U	1	
C658	NCB21EK-563X	C.CAPACITOR 25V 0.056U	1	
C659	QEP61HM-105Z	E.CAPACITOR 50V 1M	1	
C660	NCB21CK-154X	C.CAPACITOR 16V 0.15U	1	
C661	QEDC1CM-107Z	E.CAPACITOR 16V 100M	1	
C662	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C668-70	NDC21HJ-101X	C.CAPACITOR 16V 100P	3	
C671	NDC21HJ-680X	C.CAPACITOR 16V 68P	1	
C672	QEDC1HM-105Z	E.CAPACITOR 50V 1M	1	
C673	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C674,75	NCB21HK-103X	C.CAPACITOR 50V 0.01U	2	
C676	QEGR1CM-476Z	E.CAPACITOR 16V 47M	1	
C677	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C678	NDC21HJ-101X	C.CAPACITOR 50V 100P	1	
C679	NDC21HJ-220X	C.CAPACITOR 50V 22P	1	
C680	NDC21HJ-330X	C.CAPACITOR 50V 33P	1	
C681	NCB21HK-223X	C.CAPACITOR 50V 0.022U	1	
C685,86	NCB21EK-104X	C.CAPACITOR 25V 0.1U	2	
C687,88	NCB21HK-472X	C.CAPACITOR 50V 4700P	2	
C801	NCB21HK-223X	C.CAPACITOR 50V 0.022U	1	
C802	QEDC1CM-106Z	E.CAPACITOR 16V 10M	1	
C803	QEH1CM-107Z	E.CAPACITOR 16V 100M	1	
C804	NCB21HK-223X	C.CAPACITOR 50V 0.022U	1	
C805	NCB21HK-102X	C.CAPACITOR 50V 1000P	1	

C806	QEH1CM-107Z	E.CAPACITOR 16V 100M	1	
C807	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C808	QEH1CM-107Z	E.CAPACITOR 16V 100M	1	
C811,12	NCB21HK-223X	C.CAPACITOR 50V 0.022U	2	
C821,22	NCB21EK-104X	C.CAPACITOR 25V 0.1U	2	
CL1	QZW0035-001	WIRE CLAMP	1	
CN1	PEMC0915-026	CONNECTOR 26P	1	
CN3	QGB2006L1-06	CONNECTOR 3P	1	
CN4	QGB2006L1-08	CONNECTOR 8P	1	
CN301	PEMC0915-017	CONNECTOR 17P	1	
CN601	PEMC0915-113	CONNECTOR 13P	1	
CN602	PEMC0915-115	CONNECTOR 15P	1	
CN603	QGA2001C1-03	CONNECTOR 3P	1	
CN604	PEMC0915-119	CONNECTOR 19P	1	
CN605	SSV1933-12	CONNECTOR 12P	1	
CN606	QGA2001C1-11	CONNECTOR 11P	1	
CN801	PU59555-10	CONNECTOR 10P	1	
 CP601	ICP-N25-T	ICP	1	
 CP801	ICP-N20-T	ICP	1	
 CP802	ICP-N25-T	ICP	1	
D1	1SS355	DIODE	1	
D2	DAP202K	DIODE	1	
D4	RD2.0EB	ZENER DIODE	1	
D5	1SS133	DIODE	1	
D6-11	RD9.1EW	ZENER DIODE	6	
D12	1SS133	DIODE	1	
D13	1SS355	DIODE	1	
D14	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
D20	1SS133	DIODE	1	
D301,02	MA3091	ZENER DIODE	2	
D311,12	MA3091	ZENER DIODE	2	
D321	1SS133	DIODE	1	
D323	1SS133	DIODE	1	
D602,03	1SS133	DIODE	2	
D605,06	1SS133	DIODE	2	
D607,08	11ES2	DIODE	2	
D612-15	MA3091	ZENER DIODE	4	
D616	MA3160-M	DIODE	1	
D617	MA3091	ZENER DIODE	1	
D618-20	MA3160-M	DIODE	3	
D621	MA3091	ZENER DIODE	1	
D622,23	MA3160-M	DIODE	2	
D801	RD5.1JSB1	ZENER DIODE	1	
D802	DAN202K	DIODE	1	
D803	1SS133	DIODE	1	
FL1	QQR1029-001	FL FILTER	1	
FL2	QQR0859-001	FL FILTER	1	
FL3	QQR0858-001	FL FILTER	1	
FL4	QQR1030-001	FL FILTER	1	
IC1	JCP0054	IC	1	
IC2	M62353FP	IC	1	
IC3	NJM431U	IC	1	C0DBEZC00003
IC4	VC2076DP	IC	1	
IC5	HA118092FP1	IC	1	
IC6	C0JBAA000076	IC	1	
IC8	CXL1511M	IC	1	
IC9	NJM2285M	IC	1	
IC10	TC4S71F	IC	1	
IC11	MM1111XF	IC	1	
IC301	NJM2068MD	IC	1	C0ABBB000031
IC601	MN101D02HPE	IC	1	
IC602	BA6418N	IC	1	
IC603	M50253P	IC	1	
IC604	TC4021BF/N/	IC	1	
IC605	M50253P	IC	1	
IC606	TC4021BF/N/	IC	1	
IC607	NM24C04EM8	IC	1	
IC608	MM1290XF	IC	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
J1	QNZ0130-001	BNC CONNECTOR	1	
J2	QND0033-001	S JACK	1	
J301	QNN0283-001	PIN JACK 2PIN	1	
J302	QNZ0231-001	MINI JACK	1	
J601	QNN0298-001	PIN JACK	1	
K301	QQR0678-001Z	FERRITE BEADS	1	
K302	QQR1058-001Z	FERRITE BEADS	1	
K351	QQR0678-001Z	FERRITE BEADS	1	
L1	QQL02BJ-822Z	COIL 8200UH	1	
L2	QQL071J-470Y	COIL 47UH	1	
L4,L5	QQL01BJ-470Z	COIL 47UH	2	
L8,L9	QQL071J-680Y	COIL 68UH	2	
L10-13	QQL01BJ-101Z	COIL 100UH	4	
L14	QQL071J-5R6Y	COIL 5.6UH	1	
L15	QQR0601-001Z	COIL 000UH	1	
L16	QQL01BJ-101Z	COIL 100UH	1	
L22	QQL01BJ-101Z	COIL 100UH	1	
L23	QQL071J-560Y	COIL 56UH	1	
L25	QQL071J-390Y	COIL 39UH	1	
L27	QQL071J-101Y	COIL 100UH	1	
L28	QQL071J-680Y	COIL 68UH	1	
L29	QQL071J-100Y	COIL 10UH	1	
L31,32	QQL01BJ-101Z	COIL 100UH	2	
L33	QQL01BJ-470Z	COIL 47UH	1	
L34	QQL071J-560Y	COIL 56UH	1	
L35	QQL071J-100Y	COIL 10UH	1	
L37	QQL071J-330Y	COIL 33UH	1	
L38	QQL071J-221Y	COIL 220UH	1	
L39	QQL071J-100Y	COIL 10UH	1	
L40	QQL01BJ-101Z	COIL 100UH	1	
L41,42	QQL071J-330Y	COIL 33UH	2	
L43	QQL071J-220Y	COIL 22UH	1	
L44	QQL071J-270Y	COIL 27UH	1	
L47	QQL071J-560Y	COIL 56UH	1	
L48	QQL071J-181Y	COIL 180UH	1	
L50	QQL071J-470Y	COIL 47UH	1	
L55	QQL071J-330Y	COIL 33UH	1	
L56	QQL071J-150Y	COIL 15UH	1	
L60	QQL071J-100Y	COIL 10UH	1	
L61	QQL071J-101Y	COIL 100UH	1	
L62	QQL071J-100Y	COIL 10UH	1	
L311	QQL071J-100Y	COIL 10UH	1	
L321	QQL01BJ-101Z	COIL 100UH	1	
L602	QQL01BJ-100Z	COIL 10UH	1	
L603	QQL01BJ-221Z	COIL 220UH	1	
L604-06	QQL01BJ-101Z	COIL 100UH	3	
L801	QQL112J-101	COIL 100UH	1	
Q2	DTA144EKA	TRANSISTOR	1	
Q3,Q4	DTC144EKA	TRANSISTOR	2	
Q6	A1037AK/QR/	TRANSISTOR	1	
Q7,Q8	DTC144EKA	TRANSISTOR	2	
Q9	DTA144EKA	TRANSISTOR	1	
Q10,11	DTC144EKA	TRANSISTOR	2	
Q12	2SC2412K	TRANSISTOR	1	
Q15	DTC144EKA	TRANSISTOR	1	
Q19	A1037AK/QR/	TRANSISTOR	1	
Q20-23	2SC2412K	TRANSISTOR	4	
Q24,25	A1037AK/QR/	TRANSISTOR	2	
Q26	DTC144EKA	TRANSISTOR	1	
Q32	A1037AK/QR/	TRANSISTOR	1	
Q40	A1037AK/QR/	TRANSISTOR	1	
Q41	DTC144EKA	TRANSISTOR	1	
Q42,43	2SC2412K	TRANSISTOR	2	
Q45	2SC2412K	TRANSISTOR	1	
Q46	A1037AK/QR/	TRANSISTOR	1	
Q47	2SC2412K	TRANSISTOR	1	
Q48	A1037AK/QR/	TRANSISTOR	1	
Q49	2SC2412K	TRANSISTOR	1	
Q50	A1037AK/QR/	TRANSISTOR	1	
Q51	2SC2412K	TRANSISTOR	1	
Q53	2SC2412K	TRANSISTOR	1	
Q54	2SK621	FET	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
Q55	2SC2412K	TRANSISTOR	1	
Q56	2SD602	TRANSISTOR	1	
Q57,58	2SD601A	TRANSISTOR	2	
Q59	2SC2412K	TRANSISTOR	1	
Q60	2SD601A	TRANSISTOR	1	
Q61,62	2SC2412K	TRANSISTOR	2	
Q63	A1037AK/QR/	TRANSISTOR	1	
Q64,65	2SC2412K	TRANSISTOR	2	
Q66	DTC144EKA	TRANSISTOR	1	
Q69,70	DTC144EKA	TRANSISTOR	2	
Q71	A1037AK/QR/	TRANSISTOR	1	
Q73	2SC2412K	TRANSISTOR	1	
Q74	A1037AK/QR/	TRANSISTOR	1	
Q75	2SC2412K	TRANSISTOR	1	
Q76	A1037AK/QR/	TRANSISTOR	1	
Q77,78	2SC2412K	TRANSISTOR	2	
Q80	A1037AK/QR/	TRANSISTOR	1	
Q81-85	2SC2412K	TRANSISTOR	5	
Q86	A1037AK/QR/	TRANSISTOR	1	
Q87	2SC2412K	TRANSISTOR	1	
Q89	2SC2412K	TRANSISTOR	1	
Q91-94	2SC2412K	TRANSISTOR	4	
Q95	DTC144EKA	TRANSISTOR	1	
Q601,02	A1037AK/QR/	TRANSISTOR	2	
Q603	DTC144EKA	TRANSISTOR	1	
Q604	DTA144EKA	TRANSISTOR	1	
Q605,06	DTC144EKA	TRANSISTOR	2	
Q607	2SC2412K	TRANSISTOR	1	
Q609	DTC144EKA	TRANSISTOR	1	
Q801	2SC3616/MLK/	TRANSISTOR	1	
Q802	DTA144EKA	TRANSISTOR	1	
Q803	2SD2166/QRS/	TRANSISTOR	1	
Q804	2SC1740S	TRANSISTOR	1	
Q805	2SD1450	TRANSISTOR	1	
R2	NRSA02J-475X	M.RESISTOR 1/10W 4.7M	1	
R3	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R6	NRSA02J-333X	M.RESISTOR 1/10W 33K	1	
R7	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R9	NRSA02J-472X	M.RESISTOR 1/10W 4.7K	1	
R10	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R11,12	NRSA02J-103X	M.RESISTOR 1/10W 10K	2	
R13	NRSA02J-182X	M.RESISTOR 1/10W 1.8K	1	
R14	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R15	NRSA02J-221X	M.RESISTOR 1/10W 220	1	
R16	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R17	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R19	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R21	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R22,23	NRSA02J-101X	M.RESISTOR 1/10W 100	2	
R26	NRSA02J-123X	M.RESISTOR 1/10W 12K	1	
R27	NRSA02J-223X	M.RESISTOR 1/10W 22K	1	
R28	NRSA02J-684X	M.RESISTOR 1/10W 680K	1	
R30,31	NRSA02J-223X	M.RESISTOR 1/10W 22K	2	
R32	NRSA02J-821X	M.RESISTOR 1/10W 820	1	
R33	NRSA02J-682X	M.RESISTOR 1/10W 6.8K	1	
R34	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R36	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R37	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R38	NRSA02J-471X	M.RESISTOR 1/10W 470	1	
R39	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R40	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R41	NRSA02J-822X	M.RESISTOR 1/10W 8.2K	1	
R42	NRSA02J-273X	M.RESISTOR 1/10W 27K	1	
R44	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R45	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R46	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R48,49	NRSA02J-103X	M.RESISTOR 1/10W 10K	2	
R52	NRSA02J-223X	M.RESISTOR 1/10W 22K	1	
R58	NRSA02J-272X	M.RESISTOR 1/10W 2.7K	1	
R59	NRSA02J-562X	M.RESISTOR 1/10W 5.6K	1	
R61	NRSA02J-162X	M.RESISTOR 1/10W 1.6K	1	
R62	NRSA02J-272X	M.RESISTOR 1/10W 2.7K	1	
R63	NRSA02J-682X	M.RESISTOR 1/10W 6.8K	1	
R64-66	NRSA02J-103X	M.RESISTOR 1/10W 10K	3	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R67,68	NRSA02J-391X	M.RESISTOR 1/10W 390	2	
R69-72	NRSA02J-102X	M.RESISTOR 1/10W 1K	4	
R73,74	NRSA02J-332X	M.RESISTOR 1/10W 3.3K	2	
R75	NRSA02J-471X	M.RESISTOR 1/10W 470	1	
R76	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R77,78	NRSA02J-102X	M.RESISTOR 1/10W 1K	2	
R79	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R80	NRSA02J-162X	M.RESISTOR 1/10W 1.6K	1	
R81	NRSA02J-151X	M.RESISTOR 1/10W 150	1	
R82	NRSA02J-331X	M.RESISTOR 1/10W 330	1	
R83,84	NRSA02J-332X	M.RESISTOR 1/10W 3.3K	2	
R85	NDC21HJ-680X	C.CAPACITOR 50V 68	1	
R86	NRSA02J-272X	M.RESISTOR 1/10W 2.7K	1	
R87	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R88	NRSA02J-823X	M.RESISTOR 1/10W 82K	1	
R89	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R90	NRSA02J-273X	M.RESISTOR 1/10W 27K	1	
R91	NRSA02J-181X	M.RESISTOR 1/10W 180	1	
R92,93	NRSA02J-0R0X	M.RESISTOR 1/10W 0	2	
R95-97	NRSA02J-0R0X	M.RESISTOR 1/10W 0	3	
R99,00	NRSA02J-103X	M.RESISTOR 1/10W 10K	2	
R101	NQR0200-005X	COIL	1	
R102-07	NRSA02J-0R0X	M.RESISTOR 1/10W 0	6	
R108,09	NQR0200-005X	COIL	2	
R110	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R111	NRSA02J-822X	M.RESISTOR 1/10W 8.2K	1	
R112	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R113	NRSA02J-331X	M.RESISTOR 1/10W 330	1	
R114	NRSA02J-122X	M.RESISTOR 1/10W 1.2K	1	
R115	NRSA02J-391X	M.RESISTOR 1/10W 390	1	
R116	NRSA02J-221X	M.RESISTOR 1/10W 220	1	
R117	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R118	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R119	NRSA02J-123X	M.RESISTOR 1/10W 12K	1	
R120	NRSA02J-681X	M.RESISTOR 1/10W 680	1	
R121	NRSA02J-153X	M.RESISTOR 1/10W 15K	1	
R122	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R132	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R134	NRSA02J-823X	M.RESISTOR 1/10W 82K	1	
R135	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R136	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R137	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R155	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R156	NRSA02J-223X	M.RESISTOR 1/10W 22K	1	
R157	NRSA02J-272X	M.RESISTOR 1/10W 2.7K	1	
R158	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R161	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R162	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R163	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R164	NRSA02J-101X	M.RESISTOR 1/10W 100	1	
R165	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R166	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R167	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R168	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R169	NRSA02J-272X	M.RESISTOR 1/10W 2.7K	1	
R170	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R171,72	NRSA02J-473X	M.RESISTOR 1/10W 47K	2	
R173	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R174	NRSA02J-122X	M.RESISTOR 1/10W 1.2K	1	
R175	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R176	NRSA02J-332X	M.RESISTOR 1/10W 3.3K	1	
R177	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R178-80	NRSA02J-102X	M.RESISTOR 1/10W 1K	3	
R181	NRSA02J-101X	M.RESISTOR 1/10W 100	1	
R183	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R184	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R185	NRSA02J-821X	M.RESISTOR 1/10W 820	1	
R186	NRSA02J-223X	M.RESISTOR 1/10W 22K	1	
R187	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R188	NRSA02J-750X	M.RESISTOR 1/10W 750	1	
R189,90	NRSA02J-103X	M.RESISTOR 1/10W 10K	2	
R192-94	NRSA02J-750X	M.RESISTOR 1/10W 750	3	
R195	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R196	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R197	NRSA02J-561X	M.RESISTOR 1/10W 560	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R198	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R200	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R202	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R203	NRSA02J-333X	M.RESISTOR 1/10W 3.3K	1	
R204	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R205	NRSA02J-333X	M.RESISTOR 1/10W 3.3K	1	
R206	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R207	NRSA02J-333X	M.RESISTOR 1/10W 3.3K	1	
R208	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R209	NRSA02J-101X	M.RESISTOR 1/10W 100	1	
R211,12	NRSA02J-102X	M.RESISTOR 1/10W 1K	2	
R213	NRSA02J-473X	M.RESISTOR 1/10W 47K	1	
R214	NRSA02J-153X	M.RESISTOR 1/10W 15K	1	
R215,16	NRSA02J-750X	M.RESISTOR 1/10W 750	2	
R219	NRSA02J-471X	M.RESISTOR 1/10W 470	1	
R221	NRSA02J-183X	M.RESISTOR 1/10W 18K	1	
R222	NRSA02J-392X	M.RESISTOR 1/10W 3.9K	1	
R223	NRSA02J-681X	M.RESISTOR 1/10W 680	1	
R224	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R225	NRSA02J-221X	M.RESISTOR 1/10W 220	1	
R226	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R228	NRSA02J-822X	M.RESISTOR 1/10W 8.2K	1	
R229	NRSA02J-333X	M.RESISTOR 1/10W 33K	1	
R230,31	NRSA02J-471X	M.RESISTOR 1/10W 470	2	
R234	NRSA02J-332X	M.RESISTOR 1/10W 3.3K	1	
R235	NRSA02J-392X	M.RESISTOR 1/10W 3.9K	1	
R236,37	NRSA02J-561X	M.RESISTOR 1/10W 560	2	
R238	NRSA02J-122X	M.RESISTOR 1/10W 1.2K	1	
R239	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R240	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R241	NRSA02J-132X	M.RESISTOR 1/10W 1.3K	1	
R242	NRSA02J-101X	M.RESISTOR 1/10W 100	1	
R243	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R244	NRSA02J-183X	M.RESISTOR 1/10W 18K	1	
R245	NRSA02J-392X	M.RESISTOR 1/10W 3.9K	1	
R246	NRSA02J-182X	M.RESISTOR 1/10W 1.8K	1	
R247	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R248	NRSA02J-471X	M.RESISTOR 1/10W 470	1	
R249	NRSA02J-562X	M.RESISTOR 1/10W 5.6K	1	
R250	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R251	NRSA02J-821X	M.RESISTOR 1/10W 820	1	
R252	NRSA02J-681X	M.RESISTOR 1/10W 680	1	
R253	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R254	NRSA02J-511X	M.RESISTOR 1/10W 510	1	
R255	NRSA02J-273X	M.RESISTOR 1/10W 27K	1	
R256	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R258	NRSA02J-331X	M.RESISTOR 1/10W 330	1	
R259	NRSA02J-562X	M.RESISTOR 1/10W 5.6K	1	
R260	NRSA02J-392X	M.RESISTOR 1/10W 3.9K	1	
R261	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R262	NRSA02J-682X	M.RESISTOR 1/10W 6.8K	1	
R264	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R265	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R266,67	NRSA02J-0R0X	M.RESISTOR 1/10W 0	2	
R268-71	NRSA02J-223X	M.RESISTOR 1/10W 22K	4	
R272	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R273	NRSA02J-101X	M.RESISTOR 1/10W 100	1	
R274	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R275	NRSA02J-333X	M.RESISTOR 1/10W 33K	1	
R276	NRSA02J-105X	M.RESISTOR 1/10W 1M	1	
R277-79	NRSA02J-561X	M.RESISTOR 1/10W 560	3	
R280,81	NRSA02J-560X	M.RESISTOR 1/10W 56	2	
R282,83	NRSA02J-102X	M.RESISTOR 1/10W 1K	2	
R284	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R288	NRSA02J-564X	M.RESISTOR 1/10W 560K	1	
R291,92	NRSA02J-0R0X	M.RESISTOR 1/10W 0	2	
R294	NRSA02J-563X	M.RESISTOR 1/10W 56K	1	
R295	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R297	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R299	NRSA02J-101X	M.RESISTOR 1/10W 100	1	
R302	NRSA02J-393X	M.RESISTOR 1/10W 39K	1	
R303	NRSA02J-153X	M.RESISTOR 1/10W 15K	1	
R304	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R306	NRSA02J-473X	M.RESISTOR 1/10W 47K	1	
R307	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R308,09	NRSA02J-103X	M.RESISTOR 1/10W 10K	2	
R312	NRSA02J-332X	M.RESISTOR 1/10W 3.3K	1	
R313	NRSA02J-392X	M.RESISTOR 1/10W 3.9K	1	
R314	NRSA02J-224X	M.RESISTOR 1/10W 220K	1	
R315	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R316	NRSA02J-473X	M.RESISTOR 1/10W 47K	1	
R317	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R320-22	NRSA02J-0R0X	M.RESISTOR 1/10W 0	3	
R323	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R325	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R352,53	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	2	
R601	NRSA02J-221X	M.RESISTOR 1/10W 220	1	
R602	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R603	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R604	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R605-10	NRSA02J-102X	M.RESISTOR 1/10W 1K	6	
R611,12	NRSA02J-0R0X	M.RESISTOR 1/10W 0	2	
R613,14	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	2	
R615	NRSA02J-472X	M.RESISTOR 1/10W 4.7K	1	
R616	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R617	NRSA02J-104X	M.RESISTOR 1/10W 100K	1	
R618	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R619-22	NRSA02J-102X	M.RESISTOR 1/10W 1K	4	
R623-25	NRSA02J-103X	M.RESISTOR 1/10W 10K	3	
R627	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R628-30	NRSA02J-472X	M.RESISTOR 1/10W 4.7K	3	
R632	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R633,34	NRSA02J-102X	M.RESISTOR 1/10W 1K	2	
R636	NRSA02J-105X	M.RESISTOR 1/10W 1M	1	
R637	NRSA02J-332X	M.RESISTOR 1/10W 3.3K	1	
R638	NRSA02J-104X	M.RESISTOR 1/10W 100K	1	
R640	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R641	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R642	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R644	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R645	NRSA02J-681X	M.RESISTOR 1/10W 680	1	
R646-49	NRSA02J-102X	M.RESISTOR 1/10W 1K	4	
R650	NRSA02J-101X	M.RESISTOR 1/10W 100	1	
R651	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R652	NRSA02J-272X	M.RESISTOR 1/10W 2.7K	1	
R653	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R655	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R657	NRSA02J-331X	M.RESISTOR 1/10W 330	1	
R659	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R668	NRSA02J-104X	M.RESISTOR 1/10W 100K	1	
R669	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R673	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R674	NRSA02J-472X	M.RESISTOR 1/10W 4.7K	1	
R675	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R676	NRSA02J-123X	M.RESISTOR 1/10W 12K	1	
R677	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R678	NRSA02J-272X	M.RESISTOR 1/10W 2.7K	1	
R679,80	NRSA02J-0R0X	M.RESISTOR 1/10W 0	2	
R690	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R692	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R697-02	NRSA02J-103X	M.RESISTOR 1/10W 10K	6	
R703	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R704	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R707	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R708	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R711	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R713,14	NRSA02J-103X	M.RESISTOR 1/10W 10K	2	
R715	NRSA02J-562X	M.RESISTOR 1/10W 5.6K	1	
R716-21	NRSA02J-103X	M.RESISTOR 1/10W 10K	6	
R722-25	NRSA02J-101X	M.RESISTOR 1/10W 100	4	
R726-31	NRSA02J-103X	M.RESISTOR 1/10W 10K	6	
R732,33	NRSA02J-101X	M.RESISTOR 1/10W 100	2	
R734-37	NRSA02J-103X	M.RESISTOR 1/10W 10K	4	
R738,39	NRSA02J-101X	M.RESISTOR 1/10W 100	2	
R740-43	NRSA02J-103X	M.RESISTOR 1/10W 10K	4	
R744,45	NRSA02J-102X	M.RESISTOR 1/10W 1K	2	
R746-49	NRSA02J-101X	M.RESISTOR 1/10W 100	4	
R750-53	NRSA02J-102X	M.RESISTOR 1/10W 1K	4	
R754,55	NRSA02J-103X	M.RESISTOR 1/10W 10K	2	
R756-62	NRSA02J-102X	M.RESISTOR 1/10W 1K	7	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R763,64	NRSA02J-103X	M.RESISTOR 1/10W 10K	2	
R765	NRSA02J-223X	M.RESISTOR 1/10W 22K	1	
R766	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R767	NRSA02J-223X	M.RESISTOR 1/10W 22K	1	
R768-72	NRSA02J-103X	M.RESISTOR 1/10W 10K	5	
R773-76	NRSA02J-102X	M.RESISTOR 1/10W 1K	4	
R777	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R778	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R779	NRSA02J-332X	M.RESISTOR 1/10W 3.3K	1	
R780	NRSA02J-101X	M.RESISTOR 1/10W 100	1	
R781	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R782	NRSA02J-472X	M.RESISTOR 1/10W 4.7K	1	
R783	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R791	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R792	QRE141J-562	M.RESISTOR 1/10W 5.6K	1	
R801	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R802	NRSA02J-473X	M.RESISTOR 1/10W 47K	1	
R803-06	NRSA02J-471X	M.RESISTOR 1/10W 470	4	
R807	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R808	NRSA02J-101X	M.RESISTOR 1/10W 100	1	
R809	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R810	NRSA02J-473X	M.RESISTOR 1/10W 47K	1	
R811	NRSA02J-333X	M.RESISTOR 1/10W 33K	1	
R812	NRSA02J-221X	M.RESISTOR 1/10W 220	1	
R901	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R902	NRSA02J-181X	M.RESISTOR 1/10W 180	1	
R903	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R904	NRSA02J-333X	M.RESISTOR 1/10W 33K	1	
R905	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R906	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R908,09	NRSA02J-102X	M.RESISTOR 1/10W 1K	2	
R910	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R911	NRSA02J-432X	M.RESISTOR 1/10W 4.3K	1	
R912	NRSA02J-821X	M.RESISTOR 1/10W 820	1	
R913	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R915	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R916,17	NRSA02J-0R0X	M.RESISTOR 1/10W 0	2	
R918	QRE141J-361Y	C.RESISTOR 1/4W 360	1	
R929	QRE141J-182Y	C.RESISTOR 1/4W 1.8K	1	
R930	NRSA02J-182X	M.RESISTOR 1/10W 1.8K	1	
R932	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R940	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R952-56	NRSA02J-104X	M.RESISTOR 1/10W 100K	5	
R957	QRE141J-335Y	C.RESISTOR 1/4W 3.3M	1	
RL1	QSK0035-005	RELAY	1	
TB601	SQM002-001Z	TERMINAL	1	
TH601	QAD0006-102	THERMISTOR	1	
TP2	QNZ0091-001Z	TEST POINT	1	
TP6	NNZ0022-001X	TEST POINT	1	
TP613	NNZ0022-001X	TEST POINT	1	
TP622	NNZ0022-001X	TEST POINT	1	
TP624	QNZ0091-001Z	TEST POINT	1	
VR2	QVPB609-202Z	V.RESISTOR 2K	1	
VR4	QVPB609-202Z	TRIM.RESISTOR	1	
X1	PEVB0386	CRYSTAL	1	
X601	QAX0522-001	CRYSTAL	1	
X602	QAX0520-001	CRYSTAL	1	
E3	SLK112306B0B	COMB MIX C.B.A.	1 (RTL)	
B101	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
C21	NDC21HJ-101X	C.CAPACITOR 50V 100P	1	
C114	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
C116	NDC21HJ-150X	C.CAPACITOR 50V 15P	1	
C117-19	NCB21HK-103X	C.CAPACITOR 50V 0.01U	3	
C130	NDC21HJ-5R0X	C.CAPACITOR 50V 5P	1	
C131,32	NDC21HJ-560X	C.CAPACITOR 50V 56P	2	
C133	NDC21HJ-680X	C.CAPACITOR 50V 68P	1	
C134	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C135	NCB21HK-102X	C.CAPACITOR 50V 1000P	1	
C136	NDC21HJ-150X	C.CAPACITOR 50V 15P	1	
C137	NDC21HJ-5R0X	C.CAPACITOR 50V 5P	1	
C138	NDC21HJ-150X	C.CAPACITOR 50V 15P	1	
C139	NCB21HK-473X	C.CAPACITOR 50V 0.047U	1	
C239	NDC21HJ-151X	C.CAPACITOR 50V 150P	1	
C241	QEGR1VM-106Z	E.CAPACITOR 50V 10M	1	
C242	NDC21HJ-330X	C.CAPACITOR 50V 33P	1	
C260	NDC21HJ-330X	C.CAPACITOR 50V 33P	1	
C261	NCB21HK-473X	C.CAPACITOR 50V 0.047U	1	
CN3	QGB2006M1-06	CONNECTOR 6P	1	
CN4	QGB2006M1-08	CONNECTOR 8P	1	
L17	QQL071J-330Y	COIL 33UH	1	
L18	QQL071J-820Y	COIL 82UH	1	
L19,20	QQL071J-680Y	COIL 68UH	2	
L51	QQL071J-101Y	COIL 100UH	1	
L59	QQL071J-390Y	COIL 39UH	1	
Q27	2SC2412K	TRANSISTOR	1	
Q28	DTC144EKA	TRANSISTOR	1	
Q29,30	A1037AK/QR/	TRANSISTOR	2	
Q31	2SC2412K	TRANSISTOR	1	
Q33	2SC2412K	TRANSISTOR	1	
Q35	2SC2412K	TRANSISTOR	1	
Q37-39	2SC2412K	TRANSISTOR	3	
Q96	2SC2412K	TRANSISTOR	1	
Q97,98	A1037AK/QR/	TRANSISTOR	2	
R123	NRSA02J-223X	M.RESISTOR 1/10W 22K	1	
R124	NRSA02J-153X	M.RESISTOR 1/10W 15K	1	
R125	NRSA02J-751X	M.RESISTOR 1/10W 750	1	
R126	NRSA02J-681X	M.RESISTOR 1/10W 680	1	
R127	NRSA02J-333X	M.RESISTOR 1/10W 33K	1	
R128	NRSA02J-562X	M.RESISTOR 1/10W 5.6K	1	
R129	NRSA02J-681X	M.RESISTOR 1/10W 680	1	
R130	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R131	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R138	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R139	NRSA02J-221X	M.RESISTOR 1/10W 220	1	
R140	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R142	NRSA02J-153X	M.RESISTOR 1/10W 15K	1	
R144	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R146	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R147,48	NRSA02J-112X	M.RESISTOR 1/10W 1.1K	2	
R149	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R150	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R151	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R152	NRSA02J-472X	M.RESISTOR 1/10W 4.7K	1	
R154	NRSA02J-272X	M.RESISTOR 1/10W 2.7K	1	
R199	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R287	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R921	NRSA02J-333X	M.RESISTOR 1/10W 33K	1	
R922	NRSA02J-153X	M.RESISTOR 1/10W 15K	1	
R923-26	NRSA02J-102X	M.RESISTOR 1/10W 1K	4	
R928	NRSA02J-332X	M.RESISTOR 1/10W 3.3K	1	
R951	NRSA02J-681X	M.RESISTOR 1/10W 680	1	
■ E4	PB2066A-02	A/C HEAD C.B.A.	1 (RTL)	
CN1	PU60910-107	CONNECTOR 7P	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
■ E5	SLK112303C0B	FRONT 1 C.B.A.	1 (RTL)	
C1	NCB21EK-104X	C.CAPACITOR 25V 0.1U	1	
C2	QEK1CM-476Z	E.CAPACITOR 16V 47M	1	
C3	QEK1CM-106Z	E.CAPACITOR 50V 10M	1	
C4	NCB21HK-102X	C.CAPACITOR 50V 1000P	1	
C5,C6	NCB21HK-473X	C.CAPACITOR 50V 0.047U	2	
C7	NDC21HJ-330X	C.CAPACITOR 50V 33P	1	
C8	NDC21HJ-101X	C.CAPACITOR 50V 100P	1	
C10	NDC21HJ-101X	C.CAPACITOR 50V 100P	1	
CN1	PEMC0915-113	CONNECTOR 13P	1	
CN2	QGA2001C1-07	CONNECTOR 7P	1	
D1	11ES2	DIODE	1	
D2	SLR-56VR3F	LED	1	
D4	SLR-56VR3F	LED	1	
D5	RD4.7ES/B2/	ZENER DIODE	1	
D11-17	1SS133	DIODE	7	
FDP1	PGZ02035	FDP	1	
FDP2	PQ34951	FDP HOLDER (L)	1	
FDP3	PQ34952	FDP HOLDER (R)	1	
HD1	PQ43191	LED HOLDER	1	
IC1	UPD16311GC	IC	1	
L1	QQL01BJ-101Z	COIL 100UH	1	
R1	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R2	NRSA02J-331X	M.RESISTOR 1/10W 330	1	
R4	NRSA02J-331X	M.RESISTOR 1/10W 330	1	
R5	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R7-10	NRSA02J-272X	M.RESISTOR 1/10W 2.7K	4	
R11,12	NRSA02J-561X	M.RESISTOR 1/10W 560	2	
R13	NRSA02J-563X	M.RESISTOR 1/10W 56K	1	
R14	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R15	NRSA02J-272X	M.RESISTOR 1/10W 2.7K	1	
R21-28	NRSA02J-333X	M.RESISTOR 1/10W 33K	8	
S2	QSW0381-001Z	SWITCH	1	
■ E6	SLK112304C0A	FRONT 2 C.B.A.	1 (RTL)	
CN101	QGA2001C1-07	CONNECTOR 7P	1	
D104	SLR-56VR3F	LED	1	
HD1	PQ43191	LED HOLDER	1	
R104	QRE141J-331Y	C.RESISTOR	1	
S103	QSW0381-001Z	SWITCH	1	
■ E7	SLK112302C0B	P/R C.B.A.	1 (RTL)	
B400	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
C1-C4	NCB21HK-103X	C.CAPACITOR 50V 0.01U	4	
C6-C8	NCB21HK-103X	C.CAPACITOR 50V 0.01U	3	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
C10	NDC21HJ-821X	C.CAPACITOR 50V 820P	1	
C11-14	NCB21HK-103X	C.CAPACITOR 50V 0.01U	4	
C16-23	NCB21HK-103X	C.CAPACITOR 50V 0.01U	8	
C24-28	NCB21EK-104X	C.CAPACITOR 25V 0.1U	5	
C29	NCF21CZ-224X	C.CAPACITOR 16V 0.22U	1	
C30	NDC21HJ-390X	C.CAPACITOR 50V 39P	1	
C31	NCF21CZ-224X	C.CAPACITOR 16V 0.22U	1	
C32	NDC21HJ-470X	C.CAPACITOR 50V 47P	1	
C33,34	NCB21EK-104X	C.CAPACITOR 25V 0.1U	2	
C35	NDC21HJ-330X	C.CAPACITOR 50V 33P	1	
C36	NCF21CZ-224X	C.CAPACITOR 16V 0.22U	1	
C37	NDC21HJ-270X	C.CAPACITOR 50V 27P	1	
C38	NCF21CZ-224X	C.CAPACITOR 16V 0.22U	1	
C39	NCB21EK-104X	C.CAPACITOR 25V 0.1U	1	
C40	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C41	NCB21HK-223X	C.CAPACITOR 50V 0.022U	1	
C42	QEGR1CM-476Z	E.CAPACITOR 16V 47M	1	
C43	NCB21HK-223X	C.CAPACITOR 50V 0.022U	1	
C44	QEGR1CM-476Z	E.CAPACITOR 16V 47M	1	
C45	NDC21HJ-270X	C.CAPACITOR 50V 27P	1	
C48	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C49	NCF21CZ-334X	C.CAPACITOR 16V 0.22U	1	
C50	NDC21HJ-100X	C.CAPACITOR 50V 10P	1	
C51	NCB21AK-105X	C.CAPACITOR 10V 1U	1	
C52	QEGR1CM-476Z	E.CAPACITOR 16V 47M	1	
C53	NCB21HK-223X	C.CAPACITOR 50V 0.022U	1	
C54	QER61HM-105Z	E.CAPACITOR 50V 1M	1	
C55	NCB21HK-223X	C.CAPACITOR 50V 0.022U	1	
C56	NDC21HJ-151X	E.CAPACITOR 50V 150P	1	
C57	NDC21HJ-8R0X	E.CAPACITOR 50V 8P	1	
C58	NDC21HJ-391X	E.CAPACITOR 50V 390P	1	
C59	NDC21HJ-120X	E.CAPACITOR 50V 12P	1	
C61	NCB21EK-104X	C.CAPACITOR 25V 0.1U	1	
C63	NDC21HJ-200X	C.CAPACITOR 50V 20P	1	
C64	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C66	NCB21EK-104X	C.CAPACITOR 25V 0.1U	1	
C67,68	NCB21HK-103X	C.CAPACITOR 50V 0.01U	2	
C70	NDC21HJ-101X	C.CAPACITOR 50V 100P	1	
C71	NDC21HJ-331X	C.CAPACITOR 50V 330P	1	
C72	NDC21HJ-470X	C.CAPACITOR 50V 47P	1	
C73	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C79,80	NCB21HK-103X	C.CAPACITOR 50V 0.01U	2	
C81	NDC21HJ-821X	C.CAPACITOR 50V 820P	1	
C82	QEGR1CM-476Z	E.CAPACITOR 16V 47M	1	
C83	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C84	NDC21HJ-121X	C.CAPACITOR 50V 120P	1	
C85	NDC21HJ-181X	C.CAPACITOR 50V 180P	1	
C86	NCB21HK-102X	C.CAPACITOR 50V 1000P	1	
C87	NCB21HK-223X	C.CAPACITOR 50V 0.022U	1	
C88	QEGR1CM-226Z	E.CAPACITOR 16V 22M	1	
C89	NDC21HJ-150X	C.CAPACITOR 50V 15P	1	
C90	NCB21EK-104X	C.CAPACITOR 25V 0.1U	1	
C91	NDC21HJ-9R0X	C.CAPACITOR 50V 9P	1	
C101	NDC21HJ-680X	C.CAPACITOR 50V 68P	1	
C102	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C301	QTNC1HM-105Z	E.CAPACITOR 50V 1M	1	
C302	NDC21HJ-101X	C.CAPACITOR 50V 100P	1	
C303	QEDC1HM-475Z	E.CAPACITOR 50V 1M	1	
C304	QEDC1CM-226Z	E.CAPACITOR 16V 22M	1	
C305	QTNC1HM-105Z	E.CAPACITOR 50V 1M	1	
C306-09	NDC21HJ-101X	C.CAPACITOR 50V 100P	4	
C310	QEDC1CM-106Z	E.CAPACITOR 16V 10M	1	
C313	NCB21HK-393X	C.CAPACITOR 50V 0.039U	1	
C314	NCB21HK-333X	C.CAPACITOR 50V 0.033U	1	
C315	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C316	NCB21HK-472X	C.CAPACITOR 50V 4700P	1	
C318	QEDC1HM-105Z	E.CAPACITOR 50V 1M	1	
C331	NCB21HK-681X	C.CAPACITOR 50V 680P	1	
C332	NCB21HK-222X	C.CAPACITOR 50V 2200P	1	
C333	QEDC1HM-475Z	E.CAPACITOR 50V 4.7M	1	
C334	NCB21HK-123X	C.CAPACITOR 50V 0.012U	1	
C335	QEDC1HM-475Z	E.CAPACITOR 50V 4.7M	1	
C336	NCB21HK-471X	C.CAPACITOR 50V 470P	1	
C337	QEDC1CM-106Z	E.CAPACITOR 16V 10M	1	
C338	NCB21HK-562X	C.CAPACITOR 50V 5600P	1	


Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
C353	QEDC1HM-105Z	E.CAPACITOR 50V 1M	1	
C354	QEHC1CM-107Z	E.CAPACITOR 16V 1000M	1	
C361	NCB21HK-223X	C.CAPACITOR 50V 0.022U	1	
C362	NCB21HK-472X	C.CAPACITOR 50V 4700P	1	
C363	QEDC1CM-106Z	E.CAPACITOR 16V 10M	1	
C364	QFN31HJ-823Z	E.CAPACITOR 50V 0.082M	1	
C365,66	NCB21HK-681X	C.CAPACITOR 50V 680P	2	
CN1	PEMC0915-126	CONNECTOR 26P	1	
CN2	PU59974-8	CONNECTOR 8P	1	
CN301	PEMC0915-117	CONNECTOR 17P	1	
CN302	QGD2001C1-04	CONNECTOR 4P	1	
CN303	QGD2001C1-02	CONNECTOR 2P	1	
CN401	QGD2001C1-02	CONNECTOR 2P	1	
D1-D4	DAN202K	DIODE	4	
D5	1SS355	DIODE	1	
D6	1S2076A	DIODE	1	
D7,D8	1SS355	DIODE	2	
D10	1S2076A	DIODE	1	
D351	1SS133	DIODE	1	
IC1	HA118191ANT	IC	1	
IC301	BA7765AS	IC	1	
IC331	TC4S66F	IC	1	C0JBAS000050
L1,L2	QQL071J-221Y	COIL 220UH	2	
L3	QQL071J-100Y	COIL 10UH	1	
L4-L6	QQL01BJ-101Z	COIL 100UH	3	
L8	QQL071J-221Y	COIL 220UH	1	
L9	QQL071J-150Y	COIL 15UH	1	
L10	QQL071J-151Y	COIL 150UH	1	
L13	QQL071J-150Y	COIL 15UH	1	
L15	QQL071J-101Y	COIL 100UH	1	
L16	QQL01BJ-101Z	COIL 100UH	1	
L18	QQL071J-390Y	COIL 39UH	1	
L19	QQL071J-181Y	COIL 180UH	1	
L20	QQL071J-270Y	COIL 27UH	1	
L311	QQL25CJ-123Z	COIL 12MH	1	
L312	QQL01BJ-221Z	COIL	1	
Q1-Q4	2SC2412K	TRANSISTOR	4	
Q5	DTC144EKA	TRANSISTOR	1	
Q6-Q9	A1037AK/QR/	TRANSISTOR	4	
Q10,11	DTC144EKA	TRANSISTOR	2	
Q12	2SC2412K	TRANSISTOR	1	
Q13	DTC144EKA	TRANSISTOR	1	
Q14	2SC2412K	TRANSISTOR	1	
Q16	2SC2412K	TRANSISTOR	1	
Q21	A1037AK/QR/	TRANSISTOR	1	
Q22	2SK433	FET	1	
Q23,24	2SC2412K	TRANSISTOR	2	
Q25	A1037AK/QR/	TRANSISTOR	1	
Q26	2SC2412K	TRANSISTOR	1	
Q30,31	2SC2412K	TRANSISTOR	2	
Q32	DTC144EKA	TRANSISTOR	1	
Q33	DTA144EKA	TRANSISTOR	1	
Q34-36	DTC144EKA	TRANSISTOR	3	
Q41	DTC144EKA	TRANSISTOR	1	
Q311	DTA144EKA	TRANSISTOR	1	
Q312	DTC144EKA	TRANSISTOR	1	
Q361	2SC2412K	TRANSISTOR	1	
R1,R2	NRSA02J-123X	M.RESISTOR 1/10W 12K	2	
R4,R5	NRSA02J-333X	M.RESISTOR 1/10W 33K	2	
R6-R9	NRSA02J-122X	M.RESISTOR 1/10W 1.2K	4	
R10	NRSA02J-471X	M.RESISTOR 1/10W 470	1	
R11,12	NQR0155-004X	FILTER	2	
R13	NRSA02J-471X	M.RESISTOR 1/10W 470	1	
R14	NRSA02J-472X	M.RESISTOR 1/10W 4.7K	1	
R15	NRSA02J-121X	M.RESISTOR 1/10W 120	1	
R16	NRSA02J-331X	M.RESISTOR 1/10W 330	1	
R17,18	NQR0155-004X	FILTER	2	
R19	NRSA02J-120X	M.RESISTOR 1/10W 12	1	
R20	NRSA02J-131X	M.RESISTOR 1/10W 130	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R21	NRSA02J-820X	M.RESISTOR 1/10W 82	1	
R22	NRSA02J-471X	M.RESISTOR 1/10W 470	1	
R23	NRSA02J-820X	M.RESISTOR 1/10W 82	1	
R25	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R26	NRSA02J-393X	M.RESISTOR 1/10W 39K	1	
R27	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R28	NRSA02J-123X	M.RESISTOR 1/10W 12K	1	
R29	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R30	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R31	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R32	NRSA02J-822X	M.RESISTOR 1/10W 8.2K	1	
R33	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R35	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R36	NRSA02J-821X	M.RESISTOR 1/10W 820	1	
R38	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R39	NRSA02J-393X	M.RESISTOR 1/10W 39K	1	
R40,41	NRSA02J-473X	M.RESISTOR 1/10W 47K	2	
R42	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R43	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R45	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R50	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R52	NRSA02J-681X	M.RESISTOR 1/10W 680	1	
R53	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R54	NRSA02J-333X	M.RESISTOR 1/10W 33K	1	
R55	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R56	NRSA02J-682X	M.RESISTOR 1/10W 6.8K	1	
R57	NRSA02J-105X	M.RESISTOR 1/10W 1M	1	
R58	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R59	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R60	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R61	NRSA02J-122X	M.RESISTOR 1/10W 1.2K	1	
R62	NRSA02J-182X	M.RESISTOR 1/10W 1.8K	1	
R63	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R65	NRSA02J-332X	M.RESISTOR 1/10W 3.3K	1	
R66	NRSA02J-301X	M.RESISTOR 1/10W 300	1	
R67	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R68	NRSA02J-332X	M.RESISTOR 1/10W 3.3K	1	
R69	NRSA02J-681X	M.RESISTOR 1/10W 680	1	
R70	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R71	NRSA02J-822X	M.RESISTOR 1/10W 8.2K	1	
R72	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R80	NRSA02J-332X	M.RESISTOR 1/10W 3.3K	1	
R81	NRSA02J-123X	M.RESISTOR 1/10W 12K	1	
R82	NRSA02J-822X	M.RESISTOR 1/10W 8.2K	1	
R83	NRSA02J-270X	M.RESISTOR 1/10W 27	1	
R84	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R85	NRSA02J-221X	M.RESISTOR 1/10W 220	1	
R86	NRSA02J-331X	M.RESISTOR 1/10W 330	1	
R87	NRSA02J-681X	M.RESISTOR 1/10W 680	1	
R88	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R89	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R90	NRSA02J-562X	M.RESISTOR 1/10W 5.6K	1	
R91	NRSA02J-333X	M.RESISTOR 1/10W 33K	1	
R92	NRSA02J-471X	M.RESISTOR 1/10W 470	1	
R93	NRSA02J-472X	M.RESISTOR 1/10W 4.7K	1	
R94	NRSA02J-681X	M.RESISTOR 1/10W 680	1	
R101	NRSA02J-331X	M.RESISTOR 1/10W 330	1	
R301	NRSA02J-223X	M.RESISTOR 1/10W 22K	1	
R302	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R303	NRSA02J-472X	M.RESISTOR 1/10W 4.7K	1	
R304	NRSA02J-223X	M.RESISTOR 1/10W 22K	1	
R305	NRSA02J-474X	M.RESISTOR 1/10W 470K	1	
R306	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R307,08	NRSA02J-104X	M.RESISTOR 1/10W 100K	2	
R309	NRSA02J-513X	M.RESISTOR 1/10W 51K	1	
R311	NRSA02J-392X	M.RESISTOR 1/10W 3.9K	1	
R312	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R315	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R316	NRSA02J-681X	M.RESISTOR 1/10W 680	1	
R317	NRSA02J-821X	M.RESISTOR 1/10W 820	1	
R318	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R321	NRSA02J-822X	M.RESISTOR 1/10W 8.2K	1	
R322	NRSA02J-223X	M.RESISTOR 1/10W 22K	1	
R331	NRSA02J-100X	M.RESISTOR 1/10W 10	1	
R332	NRSA02J-273X	M.RESISTOR 1/10W 27K	1	


Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R334	NRSA02J-274X	M.RESISTOR 1/10W 270K	1	
R335	NRSA02J-511X	M.RESISTOR 1/10W 510	1	
R336	NRSA02J-562X	M.RESISTOR 1/10W 5.6K	1	
R337	NRSA02J-392X	M.RESISTOR 1/10W 3.9K	1	
R338	NRSA02J-823X	M.RESISTOR 1/10W 82K	1	
R339	NRSA02J-154X	M.RESISTOR 1/10W 150K	1	
R340	NRSA02J-473X	M.RESISTOR 1/10W 47K	1	
R341	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R342	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R351	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R354	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R357	NRSA02J-223X	M.RESISTOR 1/10W 22K	1	
R358,59	NRSA02J-103X	M.RESISTOR 1/10W 10K	2	
R361	NRSA02J-3R3X	M.RESISTOR 1/10W 3.3	1	
R362	NRSA02J-123X	M.RESISTOR 1/10W 12K	1	
R363	QRZ9005-220X	M.RESISTOR 22	1	
R364	NRSA02J-472X	M.RESISTOR 1/10W 4.7K	1	
R365	QRE141J-0R0Y	M.RESISTOR 1/4W 0	1	
R366	NRSA02J-332X	M.RESISTOR 1/10W 3.3K	1	
R367	QRE141J-0R0Y	M.RESISTOR 1/4W 0	1	
R368	NRSA02J-273X	M.RESISTOR 1/10W 27K	1	
T301	PELN0832	BIAS OSC.COIL	1	
TP1	QNZ0091-001Z	TEST POINT	1	
■ E8	SLK110901S0B	DECK TERMINAL C.B.A.	1 (RTL)	
B301	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
C601-04	NBE21CM-225X	T.CAPACITOR 16V 2.2U	4	
C605,06	NCB21HK-103X	C.CAPACITOR 50V 0.01U	2	
C607	NDC21HJ-6R0X	C.CAPACITOR 50V 6P	1	
C608	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C609	NDC21HJ-6R0X	C.CAPACITOR 50V 6P	1	
C610	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C613	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C621	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C626,27	NCB21HK-103X	C.CAPACITOR 50V 0.01U	2	
C628,29	NCF21CZ-334X	C.CAPACITOR 16V 0.33U	2	
CN1	PEMC0915-115	CONNECTOR 15P	1	
CN2	PU61434-1-1	CONNECTOR 5P	1	
CN3	QGA2001F1-02	CONNECTOR 2P	1	
CN4	QGF1009F2-12	CONNECTOR 12P	1	
CN5	QGA2001F1-05	CONNECTOR 5P	1	
CN6	PEMC0915-119	CONNECTOR 19P	1	
CN7	QGA2001F1-03	CONNECTOR 3P	1	
D1	SIR-381SB3FX	LE.DIODE	1	
IC601	M5218AFP	IC	1	
IC602	BA10393F	IC	1	
IC605	BA10393F	IC	1	
IC608	TC7W74F	IC	1	
PS1,S2	PU61433	REEL SENSOR	2	
Q1,Q2	LP40038-001A	TRANSISTOR	2	
R2	NRSA02J-223X	M.RESISTOR 1/10W 22K	1	
R4	NRSA02J-223X	M.RESISTOR 1/10W 22K	1	
R5,R6	QRE141J-151Y	M.RESISTOR 1/4W 150	2	
R7,R8	NRSA02J-221X	M.RESISTOR 1/10W 220	2	
R602	NRSA02J-472X	M.RESISTOR 1/10W 4.7K	1	
R603,04	NRSA02J-103X	M.RESISTOR 1/10W 10K	2	
R605	NRSA02J-474X	M.RESISTOR 1/10W 470K	1	
R607	NRSA02J-472X	M.RESISTOR 1/10W 4.7K	1	
R608,09	NRSA02J-103X	M.RESISTOR 1/10W 10K	2	
R610	NRSA02J-474X	M.RESISTOR 1/10W 470K	1	

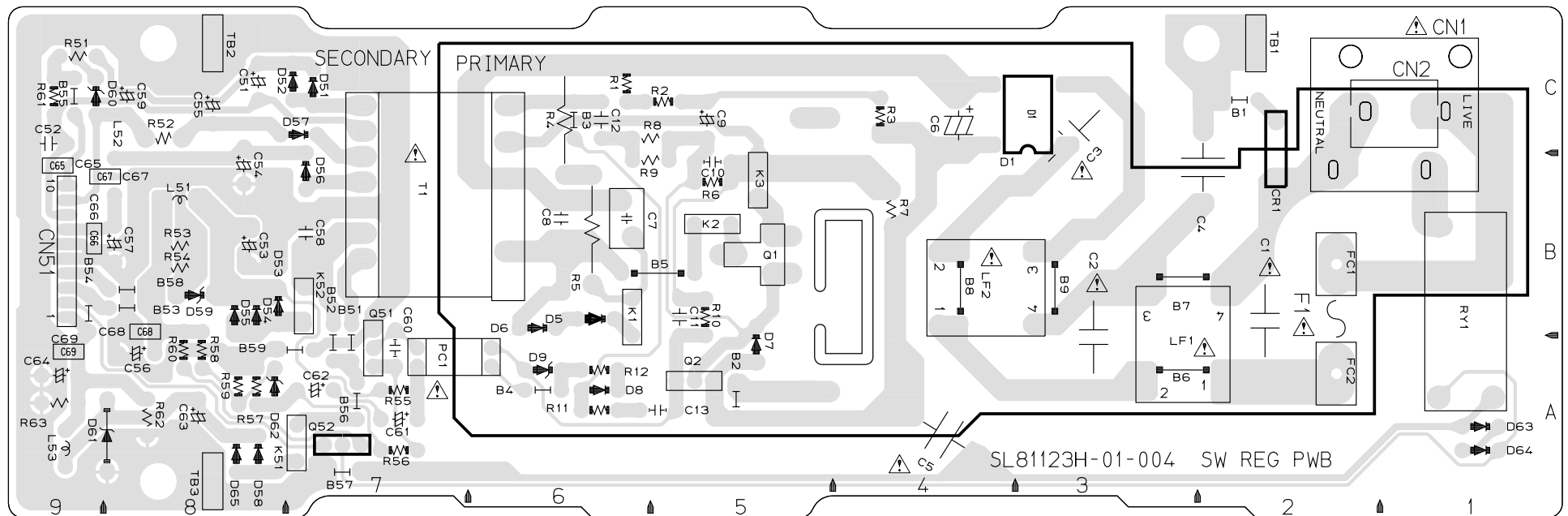
Panasonic

CAUTION

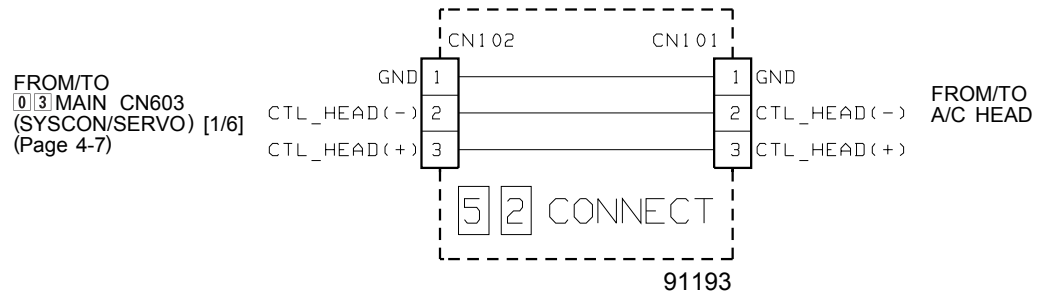
THE  MARK INDICATES THE PRIMARY CIRCUIT TO DISTINGUISH THE PRIMARY FROM THE SECONDARY CIRCUIT.
PAY ATTENTION NOT TO RECEIVE AN ELECTRIC SHOCK DURING REPAIR AND SERVICE OF THE PRODUCTS.

IMPORTANT SAFETY NOTICE:

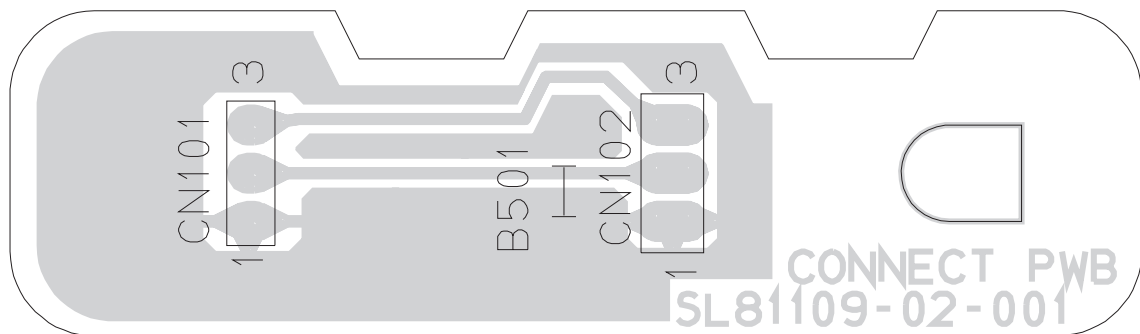
COMPONENTS IDENTIFIED WITH THE MARK  HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SAME TYPE.



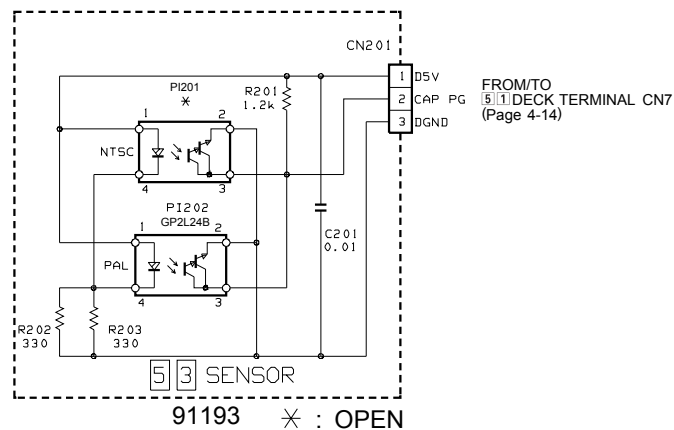
4.16 CONNECT BOARD SCHEMATIC DIAGRAM



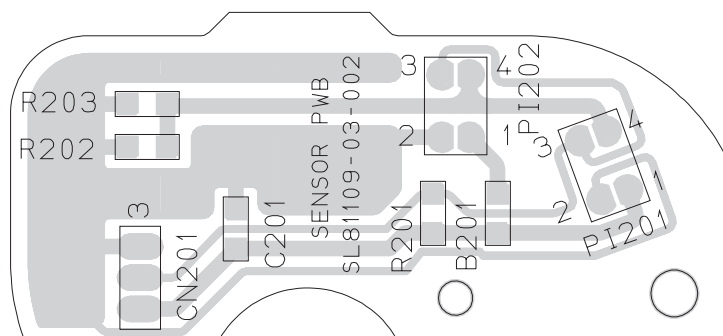
4.17 CONNECT CIRCUIT BOARD



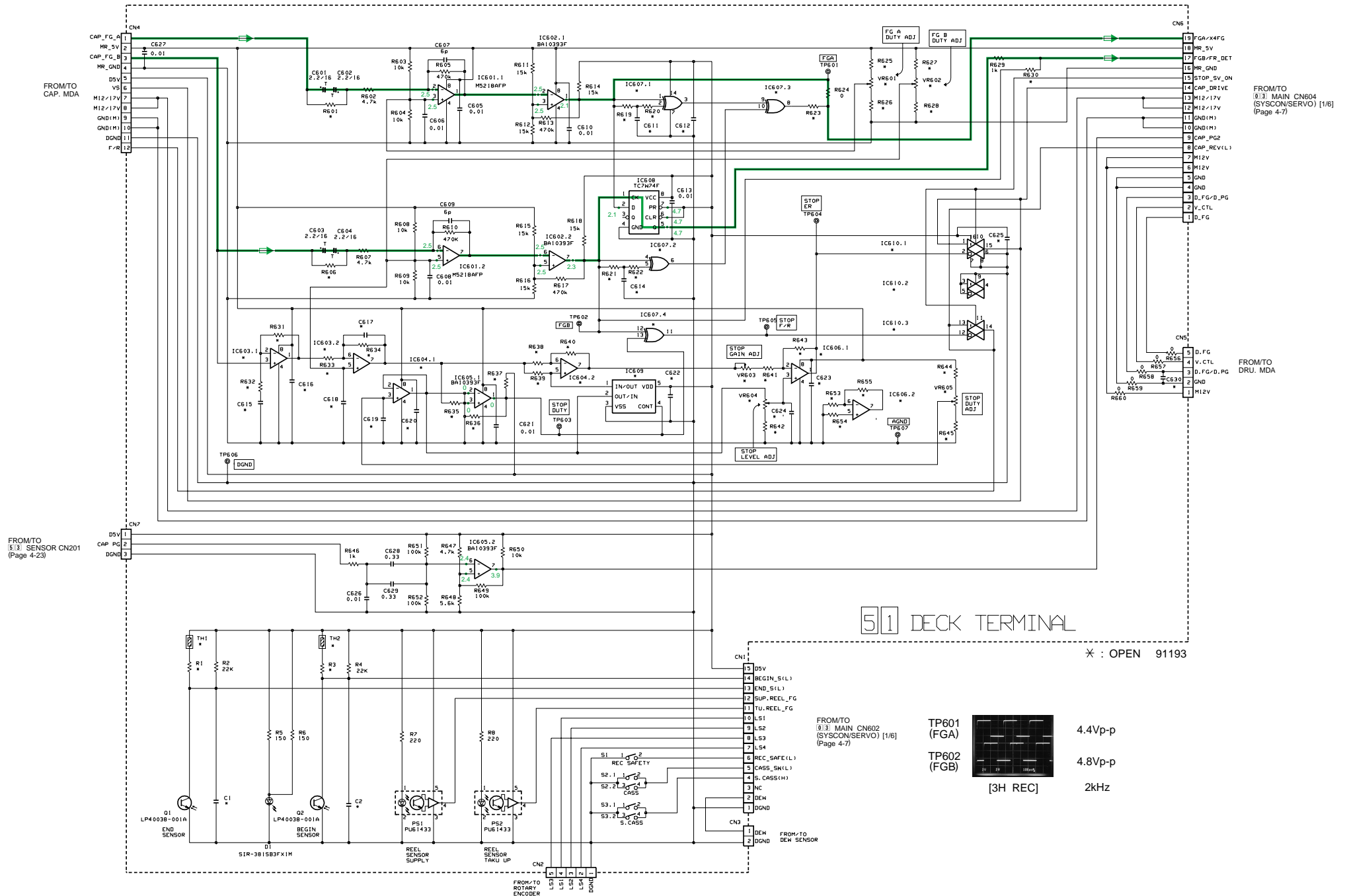
4.18 SENSOR BOARD SCHEMATIC DIAGRAM



4.19 SENSOR CIRCUIT BOARD



4.7 DECK TERMINAL BOARD SCHEMATIC DIAGRAM



SECTION 1

SERVICE CAUTIONS AND DISASSEMBLY

1.1 DISASSEMBLY OF MAJOR PARTS

1.1.1 Disassembly Flow Chart

The following flow chart shows the disassembly procedures for the PC board assembly diagnostics and mechanism diagnostics. Be sure to unplug the power cord before disassembling or assembling the products.

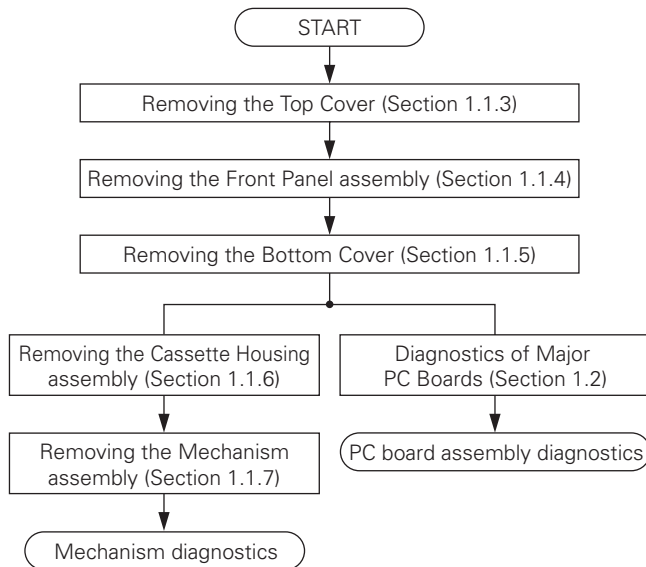


Fig. 1-1-1

1.1.2 Replacing the Fuse

CAUTION

Before replacing a fuse and in order to prevent a recurrence of the same trouble, investigate what caused the fuse to blow, repair it and confirm normal operation. To protect the equipment and provide safety, be sure to replace with a fuse having the specified part number.

- (1) Set the power switch to OFF and unplug the power cord from the power outlet before replacing the fuse.
- (2) Remove the top cover (see section 1.1.3).
- (3) Fuse F1 is located on the SW REG board.

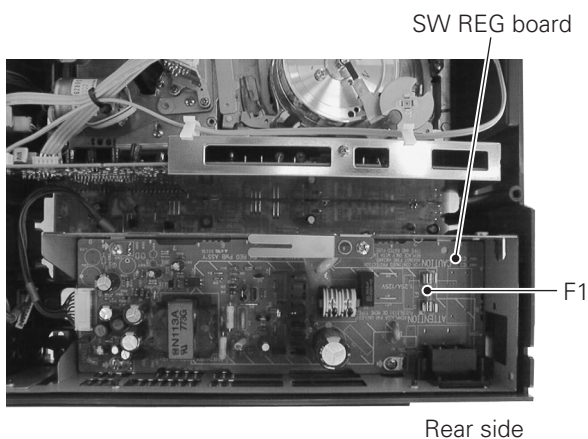


Fig. 1-1-2

1.1.3 Removing the Top Cover

- (1) Remove the 4 screws (S1).
- (2) Remove the top cover by sliding it in the direction of arrow.

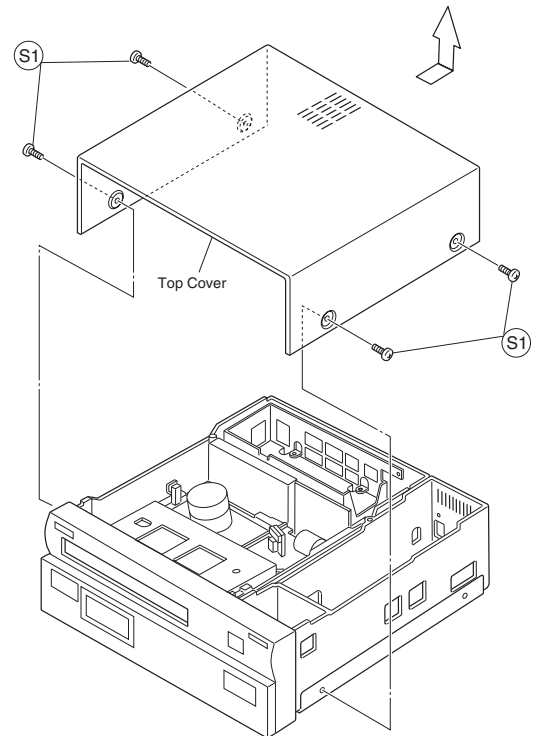


Fig. 1-1-3

1.1.4 Removing the Front Panel Assembly

- (1) Remove the top cover as described in section 1.1.3.
- (2) Disengage the 4 hooks (A) on the front panel assembly from the chassis.

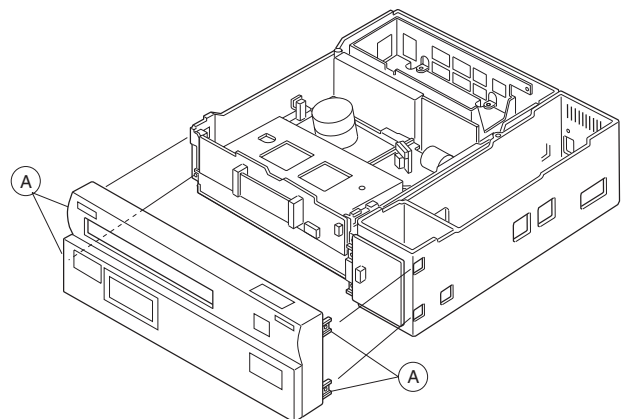


Fig. 1-1-4

1.1.5 Removing the Bottom Cover

- (1) Remove the top cover as described in section 1.1.3.
- (2) Remove the screw (S2).

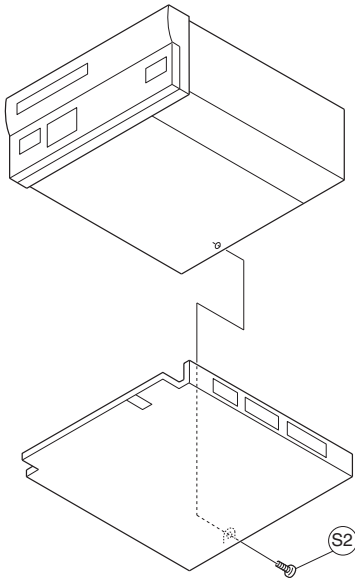


Fig. 1-1-5

1.1.6 Removing the Cassette Housing Assembly

- (1) Remove the top cover and front panel assembly as described in sections 1.1.3 and 1.1.4.
- (2) Remove the 2 screws (S3), screw (S4) and screw (S5).
- (3) Remove the cassette housing assembly by pulling the left edge of the assembly in the direction of the arrow ↑.

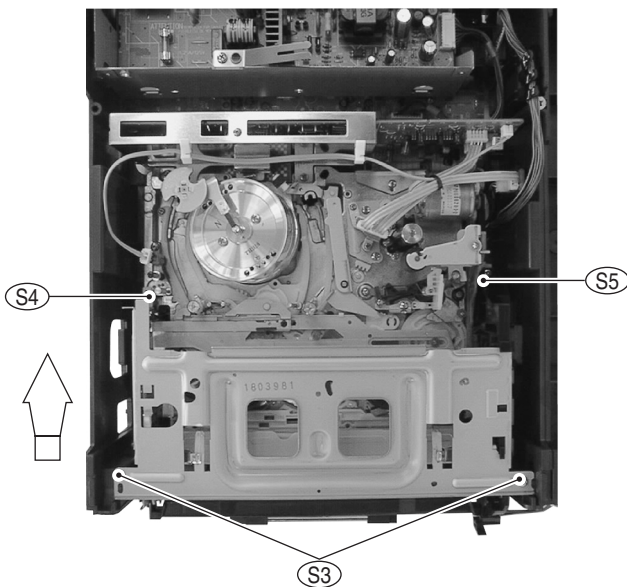


Fig. 1-1-6(a)

- (4) When attaching the cassette housing assembly, take care that the switch lever does not accidentally switch the REC SAFETY switch knob from above.

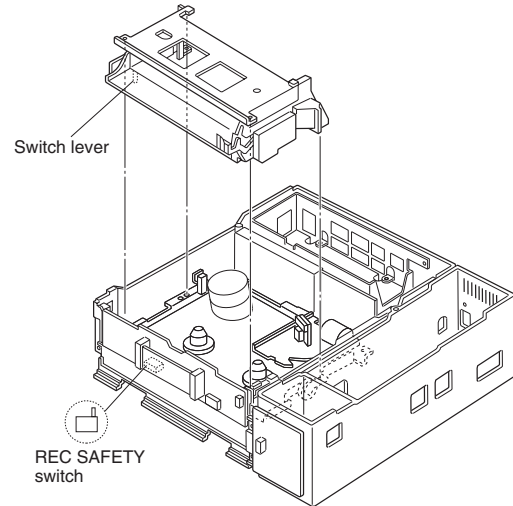


Fig. 1-1-6(b)

1.1.7 Removing the Mechanism Assembly

- (1) Remove the top cover, front panel assembly and bottom cover as described in sections 1.1.3, 1.1.4 and 1.1.5.
- (2) Remove the 2 screws (S6) from the rear panel.

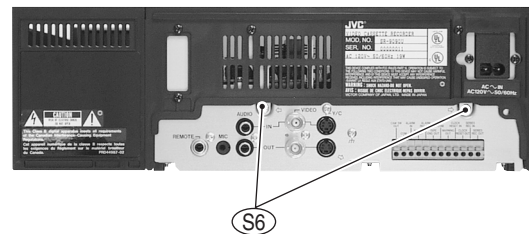


Fig. 1-1-7(a)

- (3) Remove the screw (S7) from the MAIN board, pushing the hook (B) gently in the direction of arrow ↑, then tilt the board in the direction of the arrow ⇨.

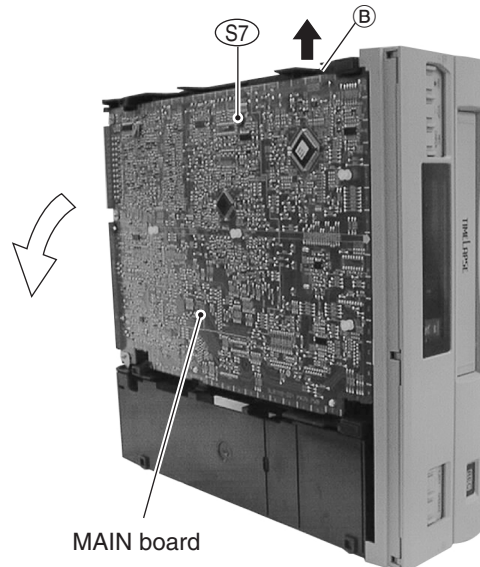


Fig. 1-1-7(b)

- (4) Unplug the connectors (C), (D), (E) and (F).

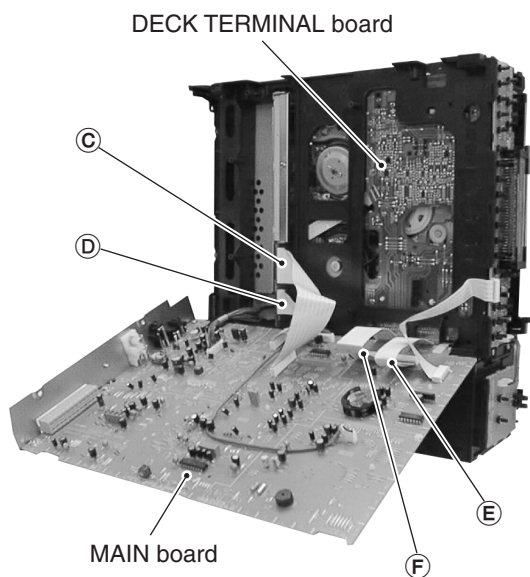


Fig. 1-1-7(c)

- (5) Unplug the connector (G).
 (6) Remove the 2 screws (S8) and 2 screws (S9), then remove the mechanism assembly in the upward direction.

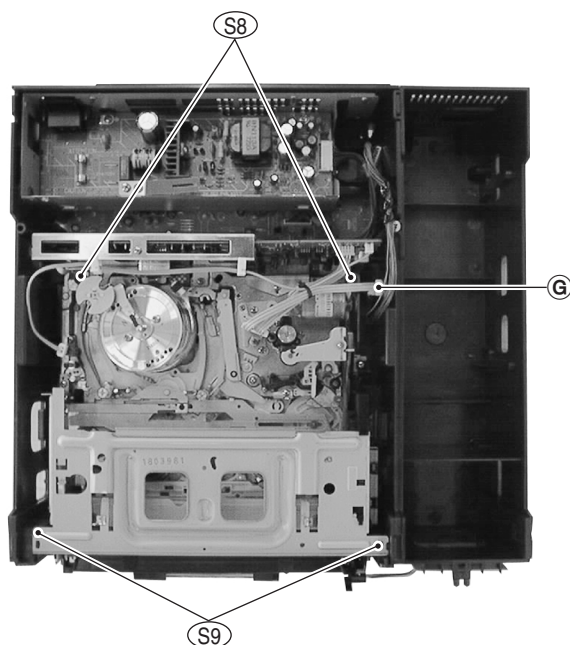


Fig. 1-1-7(d)

1.2 DIAGNOSTICS OF MAJOR PC BOARDS

1.2.1 Diagnosing the MAIN and DECK TERMINAL Boards

- (1) Remove the top cover and bottom cover as described in sections 1.1.3 and 1.1.5.
 (2) As described in section 1.1.7, disassemble the unit as shown in Figs. 1-1-7 (b) and (c) before proceeding to the diagnostics of these PC boards.

1.2.2 Diagnosing the FRONT 1 and FRONT 2 Boards

- (1) Remove the top cover and front panel assembly as described in sections 1.1.3 and 1.1.4.
 (2) Remove the FRONT 1 and FRONT 2 boards by pushing the 2 hooks (H) and 1 hook (J) gently in the direction of arrows ↑, then remove the FRONT 1 and FRONT 2 boards and diagnose them.

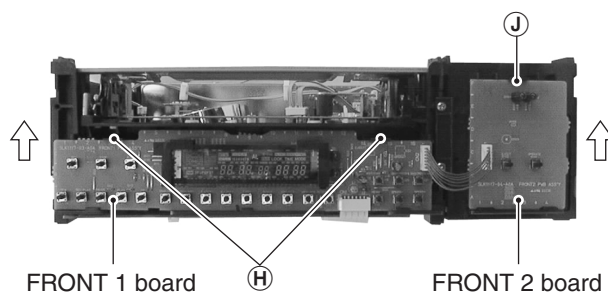


Fig. 1-2-2

1.2.3 Diagnosing the SW REG. Board

CAUTION

The supply voltage is input directly into the SW REG. board ass'y. Be careful not to get an electric shock while diagnosing and servicing.

- (1) Remove the top cover as described in section 1.1.3.
 (2) Remove the 2 screws (S10).

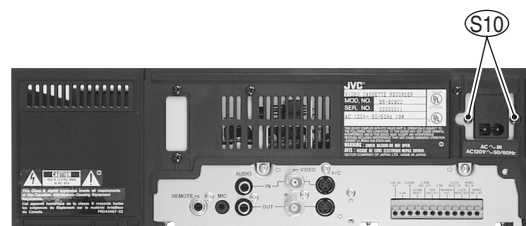


Fig. 1-2-3(a)

- (3) Remove the 3 screws (S11), remove the SW REG. board in an upward direction and diagnose it.

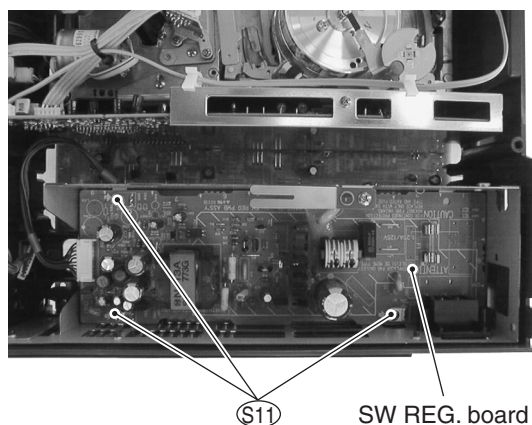


Fig. 1-2-3(b)

1.2.4 Diagnosing the P/R Board

- (1) Remove the top cover as described in section 1.1.3.
 (2) Remove the 4 screws (S12) and 2 screws (S13).

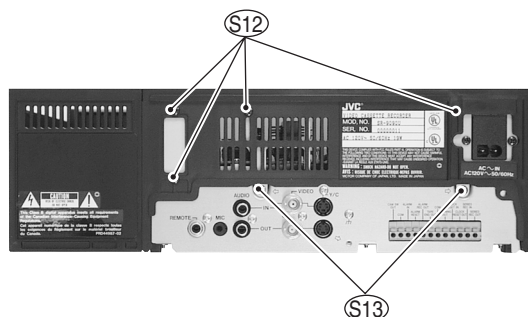


Fig. 1-2-4(a)

- (3) Remove the wire from the clamp (K), remove the screw (S14), then remove the shielded case (P/R) (L) in an upward direction.
 (4) Remove the shielded case (REG) (M) in an upward direction and diagnose the P/R board.

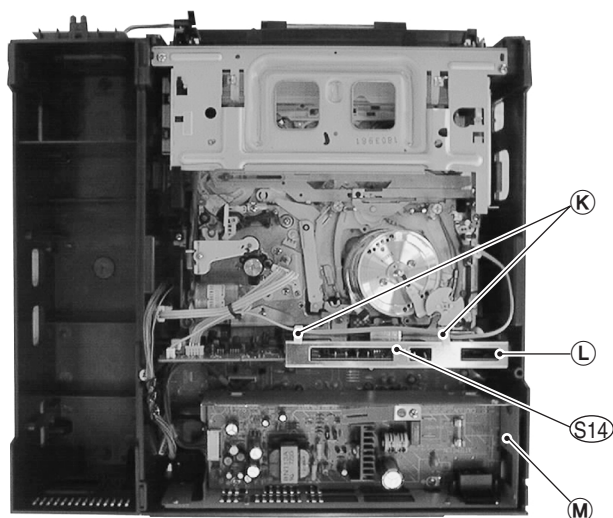


Fig. 1-2-4(b)

1.2.5 Replacing the Lithium Battery

- (1) Tilt the MAIN board as described in section 1.1.7 (1), (2) and (3).
 (2) Remove the lithium battery by pushing it lightly in the direction of the arrow ⇨.

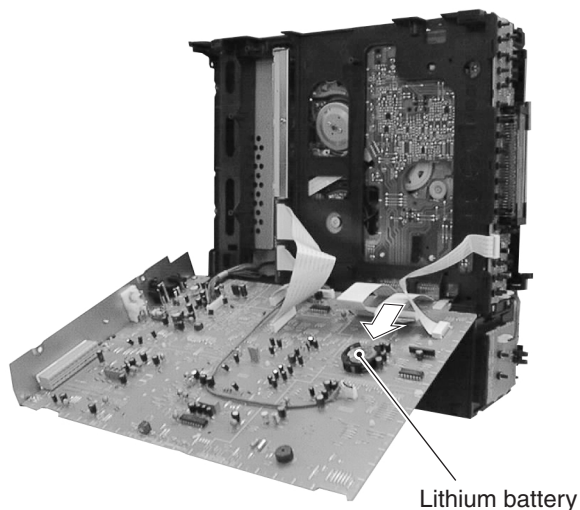


Fig. 1-2-5

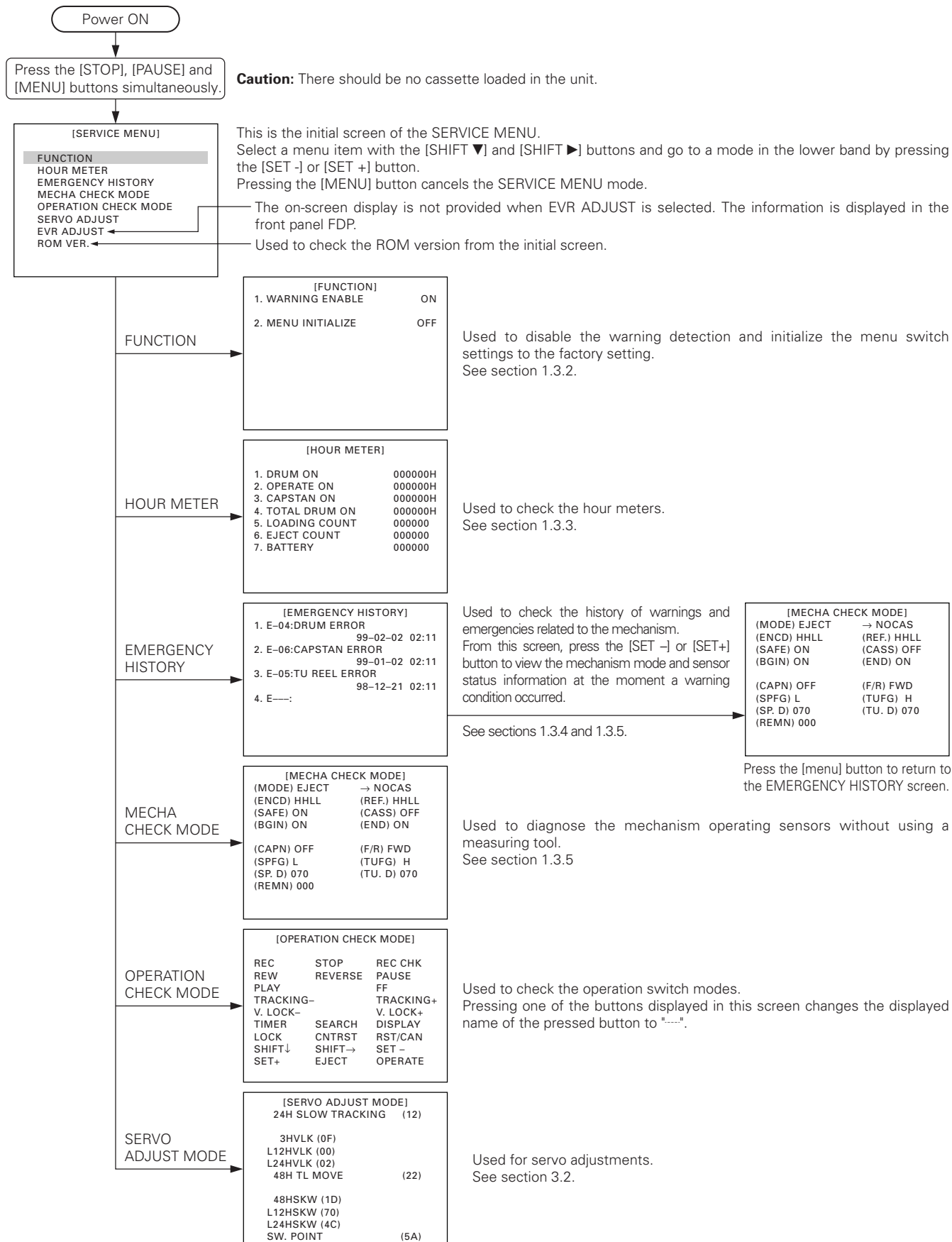
CAUTION

- Read the notes on the lithium backup battery in section 1.4.

1.3 SERVICE MENU

1.3.1 Menu Configuration and Operation Procedure

The SERVICE MENU mode is used during servicing. It is configured as shown below.



1.3.2 Function

Item	Setting	Description
1. WARNING ENABLE	[ON]	Enables warning detection.
	OFF	Disables warning detection.
2. MENU INITIALIZE		Initializes the service menu switch setting to the factory setting. Pressing the [STOP] and [RESET/CANCEL] buttons simultaneously when the cursor is located on "MENU INITIALIZE" resets the menu switch setting to the factory setting and changes the display from OFF to ON.

[] indicates the factory setting.

Table 1-3-3

1.3.3 Hour meter

This screen is used to check the hour meters.

[HOUR METER]	
1. DRUM ON	000000H
2. OPERATE ON	000000H
3. CAPSTAN ON	000000H
4. TOTAL DRUM ON	000000H
5. LOADING COUNT	000000
6. EJECT COUNT	000000
7. BATTERY	000000

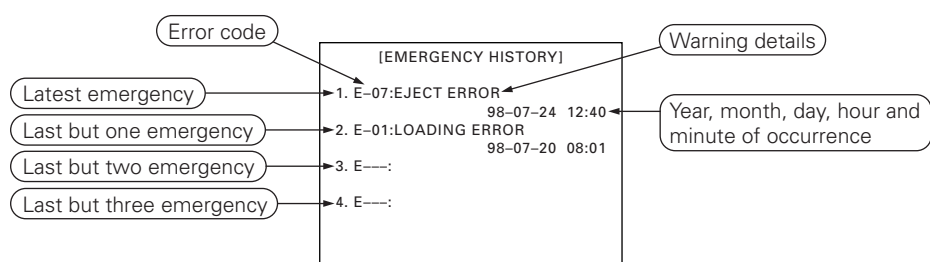
Item	Display	Description
1. DRUM ON	dh	Displays the drum rotation time.
2. OPERATE ON	Ph	Displays the operating time.
3. CAPSTAN ON	Ch	Displays the capstan rotation time.
4. TOTAL DRUM ON	td	Displays the total drum rotation time.
5. LOADING COUNT	Lc	Displays the number of loading operations.
6. EJECT COUNT	Ec	Displays the number of ejection operations.
7. BATTERY	bt	Allows writing of the current date data. Press the [RESET/CANCEL], [SET +] and [SET -] buttons simultaneously while the cursor is located on "BATTERY" to write the current date. This must be executed after the lithium battery replacement.

Table 1-3-4

1.3.4 Emergency history

This screen is used to check the history of warning emergencies related to the mechanism. The emergency history is written in the EEPROM (IC607 on the MAIN board) and records the history of the latest 4 emergencies.

Press the [STOP], [PAUSE] and [CNT RESET] buttons simultaneously while the emergency history is displayed to reset the history.



Error Code	Display	Description	Sensors	Detection Method	Possible Causes	Operation after Detection
E-01	LOADING ERROR	Loading does not complete.	Rotary encoder ↓ MAIN board IC606 ④ LS1 ⑤ LS2 ⑥ LS3 ⑦ LS4	CPU checks the rotary encoder output to see the mechanism position data and identifies the error when loading does not complete in 8 seconds.	Loading motor failure, MDA (IC602 on MAIN board) failure, Power (MOTOR 12 V) defect, Circuit protector (CP601 on MAIN board) disconnection, Loading belt defect, Mechanism part caught or stuck, Cassette tape defect.	Power goes off automatically.
E-02	UNLOADING ERROR	Unloading does not complete.		CPU checks the rotary encoder output to see the mechanism position data and identifies the error when unloading does not complete in 8 sec.		Power goes off automatically.
E-03	SP REEL ERROR	Supply reel does not rotate.	Supply reel FG ↓ MAIN board IC601 ① SUP FG	CPU identifies error when supply reel FG has not been detected for specified period of time in a mode in which the SP reel should rotate. 3H : Approx. 5 sec. L12H : Approx. 18 sec. L24H : Approx. 36 sec. 24H : Approx. 36 sec. 48H : Approx. 72 sec. 72H : Approx. 2 min. 120H : Approx. 3 min. 168H : Approx. 4 min. 240H : Approx. 6 min.	Capstan motor or drive circuit defect, Belt (Capstan), clutch ass'y or idler gear unit defect, Tape cut.	Power goes off automatically.
E-04	DRUM ERROR	Drum motor does not rotate.	Drum PG/FG ↓ MAIN board TP616 DPG	CPU identifies error when drum FG has not been detected for more than 3 seconds in a mode in which the drum motor should rotate.	Drum ass'y defect, Servo circuit defect, Power (MOTOR 12 V) defect, Circuit protector (CP601 on MAIN board) disconnection.	Power goes off automatically.
E-05	TU REEL ERROR	Take-up reel does not rotate.	Take-up reel FG ↓ MAIN board IC601 ② TU FG	CPU identifies error when take-up reel FG has not been detected for specified period of time in a mode in which the TU reel should rotate. 3H : Approx. 5 sec. L12H : Approx. 18 sec. L24H : Approx. 36 sec. 24H : Approx. 36 sec. 48H : Approx. 72 sec. 72H : Approx. 2 min. 120H : Approx. 3 min. 168H : Approx. 4 min. 240H : Approx. 6 min.	Capstan motor or drive circuit defect, Belt (Capstan), clutch ass'y or idler gear unit defect, Tape cut.	Power goes off automatically.
E-06	CAPSTAN ERROR	Capstan motor does not rotate.	Capstan FG ↓ MAIN board TP617 CFGA	CPU identifies error when capstan FG has not been detected for more than 2 seconds when pinch roller is ON in a mode in which the capstan should rotate.	Capstan motor defect, Servo circuit defect, Power (MOTOR 12 V) defect, Circuit protector (CP601 on MAIN board) disconnection.	Power goes off automatically.
E-07	EJECT ERROR	Ejection does not occur.	Cassette sensor ↓ MAIN board IC606 ⑭ ----- REC SAFETY switch ↓ MAIN board IC606 ⑮	When ejection does not complete in 8 seconds. Cassette sensor output should be 0 V at the intake end position and 5 V in other positions. REC SAFETY switch should be 0 V during ejection and 5 V at the eject end position.	Cassette housing failure, Worm clutch ass'y defect, Power (MOTOR 12 V) defect, Circuit protector (CP601 on MAIN board) disconnection.	Cassette is absorbed then power goes off automatically.
E-08	DEW ERROR	Condensation of dew.	DEW sensor ↓ MAIN board IC601 ⑯	Dew error caused by condensation is identified when pin 86 of IC601 is higher than 4 V. Dew error disappears when pin 86 of IC601 is lower than 3V.	If the error display does not disappear, the dew sensor may be defective.	Cassette is ejected, drum starts rotation and cassette will not be accepted until the condensation disappears.
E-13	TAPE DEFECTIVE	Tape is cut.	Begin sensor ↓ MAIN board IC601 ⑰ BEGIN ----- End sensor ↓ MAIN board IC601 ⑱ END	This error is identified when both the tape begin and end sensors detect leader (the level becomes Low) when a cassette is inserted.	Tape cut, Sensor defect.	Cassette is ejected then power goes off automatically.

Table 1-3-4(a)

Warning Situations That Are Not Recorded in the Emergency History

In case of the following errors, the applicable error code is displayed in the FDP on the front panel.

Error Code	Description	Sensors	Detection Method	Possible Causes	Operation after Detection
E-09	Recording check error	Pre-amp. circuit ↓ MAIN board IC601 ⑥7	This error is identified when recording check finds that the played FM level is low (pin 87 of IC601 is below 0.4 V).	Video head is dirty or its service life expired. Preamplifier circuit failure.	E-09 is displays about 10 seconds. The cleaner should be activated.
E-10	Backup battery low power error	Battery ↓ MAIN board IC608 ③	This error is identified when the battery voltage is below 2.75 V.	Battery capacity is insufficient. Battery is not loaded.	E-10 is displays when power is switched OFF.
E-11	Video signal input error	MAIN board IC601 ⑤0	This error is identified when there is no video input at VIDEO IN jack.	Video signal is not supplied.	E-11 is displayed when power is switched ON.
E-12	EEPROM write error	MAIN board IC601 ①7①8	This error is identified when a verification error occurs after EEPROM write.	EEPROM defect, CPU → EEPROM communication line defect.	E-12 is displayed when power is switched ON.

Table 1-3-4(b)

1.3.5 Mecha check mode

This screen is used to diagnose the mechanism operation sensors without using a measuring tool.

[MECHA CHECK MODE]
 (MODE) EJECT → NOCAS
 (ENCD) HHLL (REF.) HHLL
 (SAFE) ON (CASS) OFF
 (BGIN) ON (END) ON

 (CAPN) OFF (F/R) FWD
 (SPFG) L (TUFG) H
 (SP. D) 070 (TU. D) 070
 (REMN) 000

Item	Displayed Information	Input Pin	Check Method																												
(MODE)	Previous and current modes of the VCR.	—	<table> <tr> <th>Display</th><th>Description</th><th>Display</th><th>Description</th></tr> <tr> <td>ATOFF</td><td>→ AUTO OFF</td><td>PLAY</td><td>→ PLAY</td></tr> <tr> <td>OPOFF</td><td>→ OPERATE OFF</td><td>RPLAY</td><td>→ REVERSE</td></tr> <tr> <td>NOCAS</td><td>→ NO CASSETTE</td><td>STOP</td><td>→ STOP</td></tr> <tr> <td>EJECT</td><td>→ EJECT</td><td>STILL</td><td>→ STILL</td></tr> <tr> <td>FF</td><td>→ FF</td><td>S.FWD</td><td>→ SHUTTLE FWD</td></tr> <tr> <td>REW</td><td>→ REW</td><td>R.REV</td><td>→ SHUTTLE REV</td></tr> </table>	Display	Description	Display	Description	ATOFF	→ AUTO OFF	PLAY	→ PLAY	OPOFF	→ OPERATE OFF	RPLAY	→ REVERSE	NOCAS	→ NO CASSETTE	STOP	→ STOP	EJECT	→ EJECT	STILL	→ STILL	FF	→ FF	S.FWD	→ SHUTTLE FWD	REW	→ REW	R.REV	→ SHUTTLE REV
Display	Description	Display	Description																												
ATOFF	→ AUTO OFF	PLAY	→ PLAY																												
OPOFF	→ OPERATE OFF	RPLAY	→ REVERSE																												
NOCAS	→ NO CASSETTE	STOP	→ STOP																												
EJECT	→ EJECT	STILL	→ STILL																												
FF	→ FF	S.FWD	→ SHUTTLE FWD																												
REW	→ REW	R.REV	→ SHUTTLE REV																												
(ENCD)	Rotary encoder output level.	MAIN board IC606 ④ LS1 IC606 ⑥ LS2 IC606 ⑥ LS3 IC606 ⑦ LS4	<p>The H/L display varies according to the mechanism position.</p> <p>(ENCD)</p>																												
(REF.)	Normal output level of rotary encoder.	—	<p>(REF.)</p>																												
(SAFE)	REC SAFETY switch status.	MAIN board IC606 ①5	<p>ON: When a cassette with a broken safety tab is inserted or during cassette loading/ejection.</p> <p>OFF: When a cassette with integral safety tab is inserted or when no cassette is loaded.</p>																												
(CASS)	Cassette switch status.	MAIN board IC606 ①4	<p>ON: When a cassette is inserted.</p> <p>OFF: When no cassette is loaded or during cassette loading/ejection.</p>																												
(BGIN)	Tape begin sensor status.	MAIN board IC601 ②0	<p>ON: When the leader tape is detected or when no cassette is loaded.</p> <p>OFF: When the magnetic tape section is detected.</p>																												
(END)	Tape end sensor status.	MAIN board IC601 ②1	<p>ON: When the leader tape is detected or when no cassette is loaded.</p> <p>OFF: When the magnetic tape section is detected.</p>																												
(CAPN)	Capstan motor operation mode.	MAIN board TP617	<p>ON: When the capstan motor is rotating.</p> <p>OFF: When the capstan motor is stopped.</p>																												
(F/R)	Capstan motor rotation direction.	MAIN board TP610	<p>FWD: During forward rotation.</p> <p>REV: During reverse rotation.</p>																												
(SPFG)	SP reel FG sensor status.	MAIN board IC601 ①	<p>H/L are alternated when the reel disk rotates. The alternation rate increases when the rotation speed increases.</p>																												
(TUFG)	TU reel FG sensor status.	MAIN board IC601 ②																													
(SP. D)	SP reel winding diameter (in mm).	—																													
(TU. D)	TU reel winding diameter (in mm).	—																													
(REMN)	Current remaining tape (in min.) assuming that the tape speed is SP.	—	<p>If the tape speed during FF or REW operation does not decelerate near the end or the beginning of the tape, the detection by one of these sensors may be defective.</p> <p>In this case, check if the reel FG and capstan FG signals are supplied normally to the CPU.</p>																												

Table 1-3-5(a)

Switch and Sensor Layout

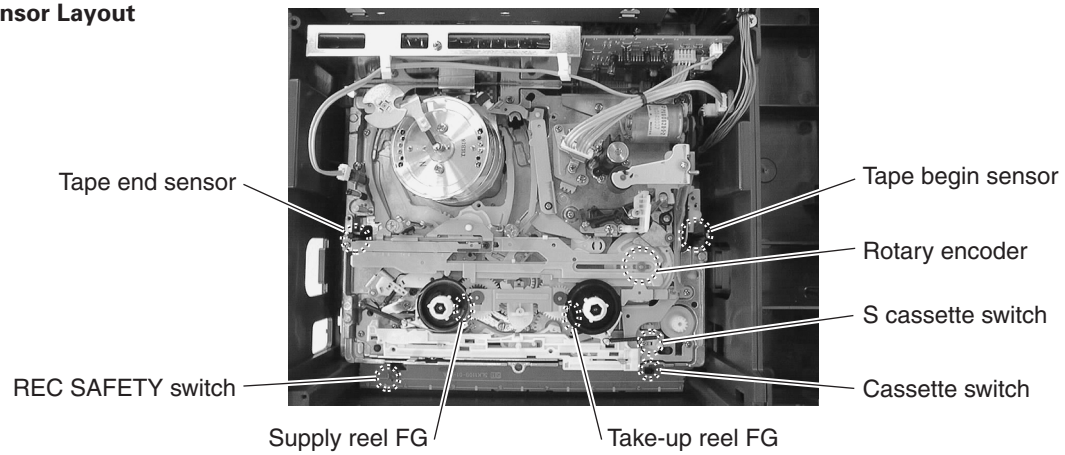


Fig. 1-3-5(b)

Mechanism Mode Chart

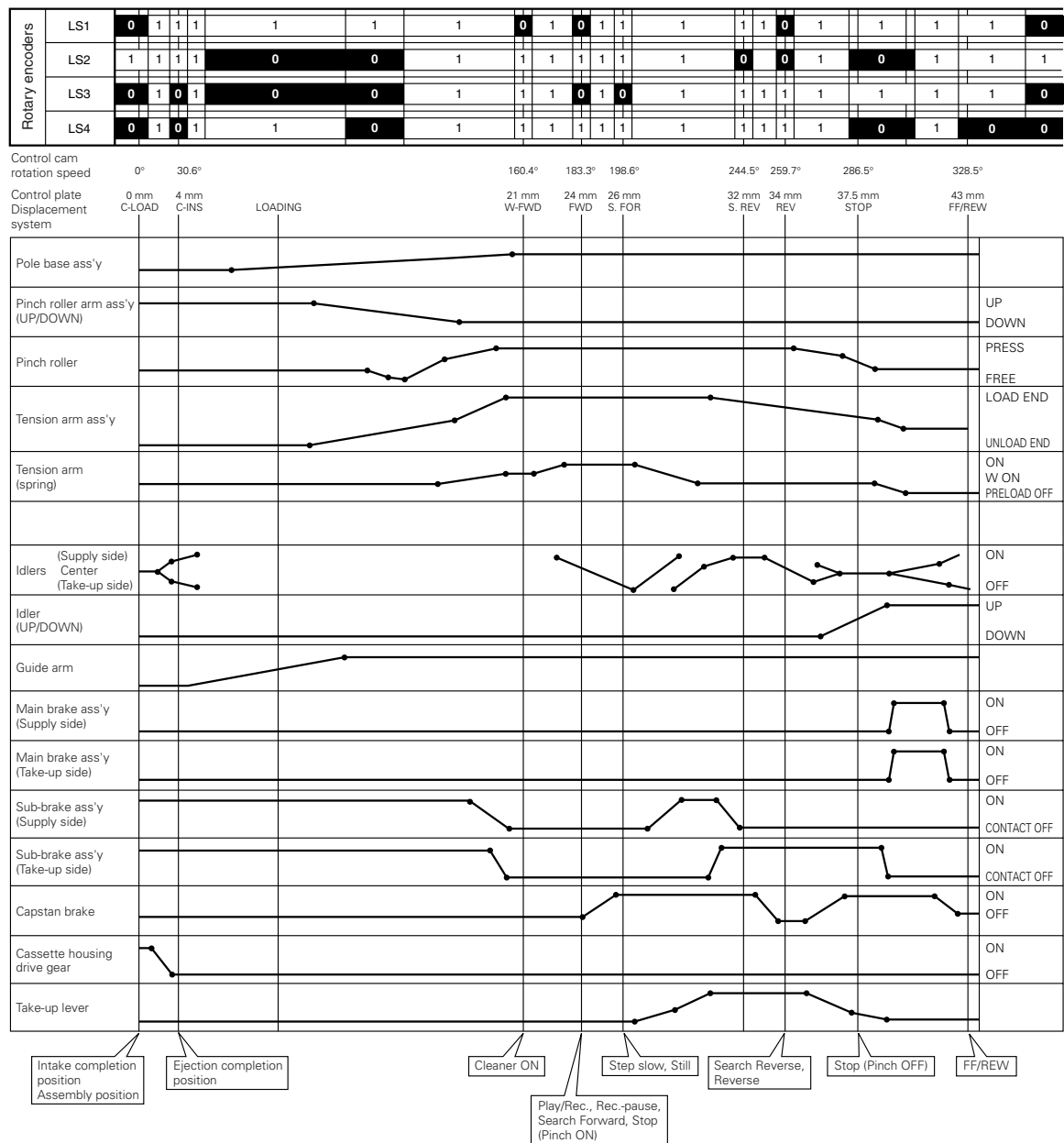


Fig. 1-3-5(c)

1.4 LITHIUM BACKUP BATTERY

1.4.1 Battery Replacement Caution

Do not leave the unit without restoring the power supply after the lithium battery has been replaced with the power cord unplugged, as this causes the backup current to flow continuously and the lithium battery life will be reduced. Be sure to turn the power ON after replacing the lithium battery.

The unit incorporates a function for storing the date of a lithium battery replacement in the memory. After replacing the lithium battery, also be sure to execute this function by referring to "7. BATTERY" in section 1.3.3

1.4.2 Time/Date Backup

When the power supply to the unit has failed due to an electrical power failure or the unplugging of the power cord, this unit uses the lithium battery to back up the CPU (IC601 on the MAIN board) in order to protect the clock operation and set data. Typically a lithium battery is capable of backing up the memory data for about 2 years. When the lithium battery voltage drops below 2.85 V, this unit displays an error message "E-10" to notify the replacement timing. When the lithium battery is replaced with the power cord unplugged, the CPU will be reset. In this case, the time setting of the unit after the battery replacement is reset.

1.5 EEPROM

IC607 on the MAIN board is an EEPROM capable of electrical erasure/write operations. This EEPROM stores the following data.

(1) Hour meter data

Data as displayed under item "HOUR METER" in the SERVICE MENU, and the "HOUR METER" data in the user menu.

(2) Adjustment data

Data of the adjustment items displayed under items "SERVO ADJUST" and "EVR ADJUST" in the SERVICE MENU.

When EEPROM is replaced, reset the adjustment data of the EVR ADJUST before performing all the adjustments shown in the following tables.

* For the resetting method of the EVR ADJUST adjustment data, see section 3.3.2 (7).

① SERVO ADJUST

Section	Adjustment Item
3.4.1	SW point adjustment
3.4.2	V-lock adjustment
3.4.3	Slow tracking preset adjustment
3.4.4	Skew adjustment

② EVR ADJUST

Section	Adjustment Item
3.5.1	AGC level adjustment
3.5.3	Sub-emphasis input level adjustment
3.5.4	White & dark clip adjustment
3.5.5	Carrier & deviation adjustments
3.5.6	S-VHS ET SP REC FM level adjustment
3.5.7	S-VHS SP REC FM level adjustment
3.5.8	Pilot burst level adjustment
3.5.9	S-VHS PB Y level adjustment
3.5.11	S-VHS ET SP REC color level adjustment
3.5.12	S-VHS SP REC color level adjustment

(3) Emergency history data

Data of the history of the last 4 emergencies as displayed under item "EMERGENCY HISTORY" in the SERVICE MENU.

(4) Menu switch setting data

Data set under item "FUNCTION" in the SERVICE MENU, and setting data in the user menu.

1.6 CIRCUIT PROTECTORS

The MAIN board has circuit protectors as shown in Fig. 1-6.

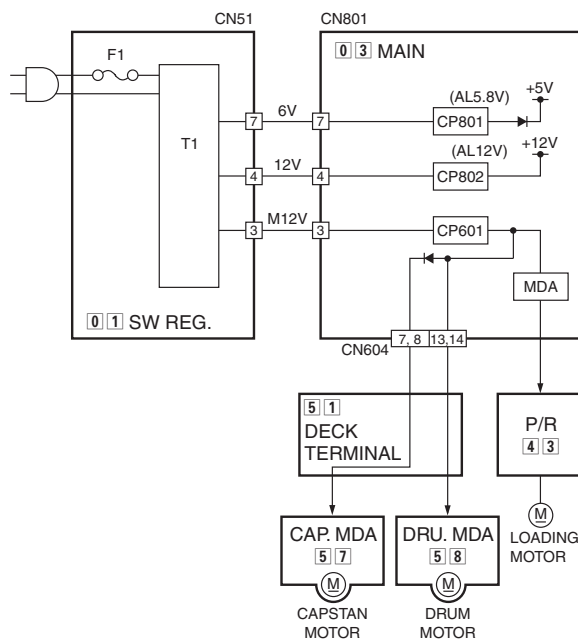


Fig. 1-6

Table 1-6 shows symptoms when each circuit protector wire is disconnected.

Symbol No.	Board Address	Symptom
CP601	16E	Loading motor and drum motor do not rotate. When a cassette tape is not inserted, warning message "E-01" is displayed. When a cassette tape is inserted, warning message "E-02" is displayed.
CP801	16C	The information is not displayed in the front panel FDP.
CP802	17D	Operate on is impossible. Drum motor does not rotate. When a cassette tape is inserted, warning message "E-02" is displayed.

Table 1-6

1.7 RESETTING THE MICROCOMPUTER IN CASE OF A RUNAWAY

This unit uses a lithium battery to back up the microcomputer (IC601 on the MAIN board). Therefore, in case the microcomputer runs away, simply unplugging the power cord does not reset it but it is also required to remove the lithium battery temporarily as described in section 1.2.5

ELECTRICAL REPLACEMENT PARTS LIST


Components identified with the mark have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
E1	SLK112301E0B	SW. REG. C.B.A.	1	(RTL)
E2	SLK1124-E0C	MAIN C.B.A.	1	(RTL)
E3	SLK112306B0B	COMB MIX C.B.A.	1	(RTL)
E4	PB20666A-02	A/C HEAD C.B.A.	1	(RTL)
E5	SLK112303C0B	FRONT 1 C.B.A.	1	(RTL)
E6	SLK112304C0A	FRONT 2 C.B.A.	1	(RTL)
E7	SLK112302C0B	P/R C.B.A.	1	(RTL)
E8	SLK110901S0B	DECK TERMINAL C.B.A.	1	(RTL)
E9	SLK11090200A	CONNECT C.B.A.	1	(RTL)
E10	SLK110903P0B	SENSOR C.B.A.	1	(RTL)
B57	QQR0601-001Z	FERRITE BEAD	1	
C1	QFZ9051-223	P.CAPACITOR 250V 0.022U	1	
C2	QFZ9051-683	P.CAPACITOR 250V 0.068U	1	
C3	QFZ9051-333	P.CAPACITOR 250V 0.033U	1	
C5	QCZ9079-222	C.CAPACITOR 400V 2200P	1	
C6	QEZO379-107	C.CAPACITOR 400V 100U	1	
C7	QCZ0212-472	C.CAPACITOR 125V 4700P	1	
C8	QCZO302-220Z	C.CAPACITOR 1000V 22P	1	
C9	QTMC1HM-105Z	E.CAPACITOR 50V 1U	1	
C11	QFLC1HJ-183Z	P.CAPACITOR 50V 0.018U	1	
C12	QFV11HJ-104Z	P.CAPACITOR 50V 0.1U	1	
C13	QCBBIHJ-271Y	C.CAPACITOR 50V 270P	1	
C51	QEMU1AM-227Z	E.CAPACITOR 10V 220U	1	
C52	QFLC1HJ-103Z	P.CAPACITOR 50V 0.01U	1	
C53	QEM91CM-82T	E.CAPACITOR 16V 820U	1	
C54	QEM91AM-128	E.CAPACITOR 10V 1200U	1	
C55	QEMU1HM-276Z	E.CAPACITOR 50V 27U	1	
C56	QTMC1CM-477Z	E.CAPACITOR 16V 470U	1	
C57	QTMC1AM-477Z	E.CAPACITOR 10V 470U	1	
C58	QCZ0136-331Z	C.CAPACITOR 125V 330P	1	
C59	QTMC1HM-226Z	E.CAPACITOR 50V 22U	1	
C60	QCBBIHJ-101Y	C.CAPACITOR 50V 100P	1	
C61,62	QTMC1HM-105Z	E.CAPACITOR 50V 1U	2	
C65-68	NCB21HK-223X	C.CAPACITOR 50V 0.022U	4	
CN51	QGA2001F1-10	CONNECTOR 10P	1	
CN1	QNC0051-001	CONNECTOR 2P	1	
D1	S1WB/A/60-X	DIODE	1	
D5,D6	AU01	DIODE	2	
D7,D8	1SS133	DIODE	2	
D9	RD27ES/B/2	ZENER DIODE	1	
D51,52	1SS133	DIODE	2	
D53-55	AU02Z	DIODE	3	
D56	AK04	DIODE	1	
D57	AU01Z	DIODE	1	
D59	RD15ES/B/1	ZENER DIODE	1	
D60	MTZ30A-T2	ZENER DIODE	1	
D62	RD6.2ES/B/3	ZENER DIODE	1	




Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
FC1,C2	QNG0037-001Z	FUSE HOLDER	2	
K1,K2	QQR0601-001Z	FERRITE BEAD	2	
L51,52	PELN0696-330	COIL 33UH	2	
⚠ LF1	PELN0885	LINE FILTER	1	
⚠ LF2	PELN0876	LINE FILTER	1	
PC1	PC123FY2	IC	1	B3PAA0000012
Q1	2SK212800SLT	FET	1	
Q2	D2144S/UVW/	TRANSISTOR	1	
Q51	2SC1740S	TRANSISTOR	1	
R1,R2	QRE141J-224Y	C.RESISTOR 1/4W 220K	2	
R3	QRE141J-683Y	C.RESISTOR 1/4W 68K	1	
R4,R5	QRL027J-333	M.RESISTOR 2W 33K	2	
R6	QRE141J-224Y	C.RESISTOR 1/4W 220K	1	
R7	QRT01DJ-R39X	M.RESISTOR 1W 0.39	1	
R8	QRG02DJ-331X	M.RESISTOR 2W 330	1	
R10	QRE141J-681Y	C.RESISTOR 1/4W 680	1	
R11	QRE141J-222Y	C.RESISTOR 1/4W 2.2K	1	
R12	QRE141J-152Y	C.RESISTOR 1/4W 1.5K	1	
R51	QRG01DJ-150X	M.RESISTOR 1W 15	1	
R52	QRZ9005-470X	F.RESISTOR 47	1	
R53,54	QRE141J-472Y	C.RESISTOR 1/4W 4.7K	2	
R55	QRE141J-471Y	C.RESISTOR 1/4W 470	1	
R56	QRE141J-0R0Y	C.RESISTOR 1/4W 0	1	
R57	QRE141J-122Y	C.RESISTOR 1/4W 1.2K	1	
R58	QRA14CF-3300	M.RESISTOR 1/4W 330	1	
R59	QRA14CF-4870	M.RESISTOR 1/4W 487	1	
R61	QRE141J-222Y	C.RESISTOR 1/4W 2.2K	1	
R63	QRG02DJ-391X	M.RESISTOR 2W 390	1	
⚠ T1	QQS0010-001	SWITCH TRANSFORMER	1	
TB1	SQMX002-001Z	TERMINAL	1	
		MISCELLANEOUS		
	PGD40689	HEAT SINK	1	
	QYSDSP3008Z	SCREW	1	
■ E2	SLK1124-E0C	MAIN C.B.A.	1	(RTL)
B701	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
BT601	QNZ0149-001	LI BATT HOLDER	1	
BZ601	QAN0023-001Z	BUZZER	1	
C1	NCB21EK-104X	C.CAPACITOR 25V 0.1U	1	
C3	QEDC1HM-105Z	E.CAPACITOR 50V 1M	1	
C4	NCB21EK-563X	C.CAPACITOR 25V 0.056U	1	
C5	NCB21HK-223X	C.CAPACITOR 50V 0.022U	1	
C6	QEDC1HM-475Z	E.CAPACITOR 50V 4.7M	1	
C7	QEDC1HM-225Z	E.CAPACITOR 50V 2.2M	1	
C8,C9	NCB21EK-104X	C.CAPACITOR 25V 0.1U	2	
C10	QEDC1CM-106Z	E.CAPACITOR 16V 10M	1	
C11	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C12	NDC21HJ-101X	C.CAPACITOR 50V 100P	1	
C13	NDC21HJ-1R0X	C.CAPACITOR 50V 1P	1	
C14	NDC21HJ-300X	C.CAPACITOR 50V 30P	1	
C15	NCB21HK-473X	C.CAPACITOR 50V 0.047U	1	
C18	QEDC1HM-105Z	E.CAPACITOR 50V 1M	1	
C19	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C20	NDC21HJ-101X	C.CAPACITOR 50V 100P	1	
C22-24	QEDC1HM-474Z	E.CAPACITOR 50V 0.47M	3	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
C25	NDC21HJ-470X	C.CAPACITOR 50V 47P	1	
C26,27	NCB21HK-103X	C.CAPACITOR 50V 0.01U	2	
C28	QEDC1HM-225Z	E.CAPACITOR 50V 2.2M	1	
C29	QEDC1CM-226Z	E.CAPACITOR 16V 22M	1	
C30	QEDC1HM-225Z	E.CAPACITOR 50V 2.2M	1	
C31	NDC21HJ-270X	C.CAPACITOR 50V 27P	1	
C32	QEDC1CM-226Z	E.CAPACITOR 16V 22M	1	
C33,34	NCB21HK-473X	C.CAPACITOR 50V 0.047U	2	
C35	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C36-38	QEDC1CM-106Z	E.CAPACITOR 16V 10M	3	
C39	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C40	QEDC1HM-474Z	E.CAPACITOR 50V 0.47U	1	
C41	QEDC1HM-104Z	E.CAPACITOR 50V 0.1U	1	
C42	QEDC1HM-474Z	E.CAPACITOR 50V 0.47U	1	
C43,44	NCB21HK-103X	C.CAPACITOR 50V 0.01U	2	
C45	NDC21HJ-680X	C.CAPACITOR 50V 68P	1	
C47	QEDC1HM-104Z	E.CAPACITOR 50V 0.1U	1	
C48	NDC21HJ-331X	C.CAPACITOR 50V 330P	1	
C49	NDC21HJ-820X	C.CAPACITOR 50V 82P	1	
C52	NDC21HJ-101X	C.CAPACITOR 50V 100P	1	
C53	NDC21HJ-330X	C.CAPACITOR 50V 33P	1	
C54	NCB21AK-105X	C.CAPACITOR 10V 1U	1	
C55	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C56	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C57,58	NCB21HK-103X	C.CAPACITOR 50V 0.01U	2	
C60	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C61	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C62-64	NCB21HK-103X	C.CAPACITOR 50V 0.01U	3	
C65	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C66	NDC21HJ-680X	C.CAPACITOR 50V 68P	1	
C67	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C70	NDC21HJ-220X	C.CAPACITOR 50V 22P	1	
C72	NDC21HJ-390X	C.CAPACITOR 50V 39P	1	
C73	NDC21HJ-150X	C.CAPACITOR 50V 15P	1	
C74	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C78	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C79	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C80	QEDC1HM-475Z	E.CAPACITOR 50V 4.7M	1	
C81,82	QEDC1HM-225Z	E.CAPACITOR 50V 2.2M	2	
C83	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C84,85	NDC21HJ-301X	C.CAPACITOR 50V 300P	2	
C86	NDC21HJ-221X	C.CAPACITOR 50V 220P	1	
C87	NDC21HJ-820X	C.CAPACITOR 50V 82P	1	
C88	NDC21HJ-271X	C.CAPACITOR 50V 270P	1	
C89	NDC21HJ-470X	C.CAPACITOR 50V 47P	1	
C90	NDC21HJ-181X	C.CAPACITOR 50V 180P	1	
C91	NDC21HJ-301X	C.CAPACITOR 50V 300P	1	
C92	NDC21HJ-271X	C.CAPACITOR 50V 270P	1	
C93	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C94	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C95	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
C96	NDC21HJ-121X	C.CAPACITOR 50V 120P	1	
C97	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C99	NCB21HK-223X	C.CAPACITOR 50V 0.022U	1	
C100	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C101	QEDC1HM-105Z	E.CAPACITOR 50V 1M	1	
C102	QEDC1CM-106Z	E.CAPACITOR 16V 10M	1	
C103,04	NCB21HK-103X	C.CAPACITOR 50V 0.01U	2	
C105	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C106	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C107,08	NDC21HJ-100X	C.CAPACITOR 50V 10P	2	
C109	NCB21HK-223X	C.CAPACITOR 50V 0.022U	1	
C110	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C111	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C112	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C113	NDC21HJ-271X	C.CAPACITOR 50V 270P	1	
C115	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C120	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C121	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C122	QEDC1HM-104Z	E.CAPACITOR 50V 0.1M	1	
C123	NDC21HJ-330X	C.CAPACITOR 50V 33P	1	
C124-27	NCB21EK-104X	C.CAPACITOR 25V 0.1U	4	
C128	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C129	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C140	QTNC1CM-106Z	E.CAPACITOR 16V 10M	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
C141	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C142	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C143	NDC21HJ-120X	C.CAPACITOR 50V 12P	1	
C144	NDC21HJ-121X	C.CAPACITOR 50V 120P	1	
C146	NDC21HJ-150X	C.CAPACITOR 50V 15P	1	
C147	NDC21HJ-470X	C.CAPACITOR 50V 47P	1	
C149	NCB21HK-103X	C.CAPACITOR 50V 0.1U	1	
C150	NDC21HJ-120X	C.CAPACITOR 50V 12P	1	
C151	NDC21HJ-180X	C.CAPACITOR 50V 18P	1	
C152	NDC21HJ-121X	C.CAPACITOR 50V 120P	1	
C154	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C155	NDC21HJ-560X	C.CAPACITOR 50V 56P	1	
C157	NDC21HJ-471X	C.CAPACITOR 50V 470P	1	
C158-60	NCB21HK-103X	C.CAPACITOR 50V 0.01U	3	
C161,62	QEHR1AM-108Z	E.CAPACITOR 10V 1000M	2	
C163	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C164	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C165	QTMC1CM-476Z	E.CAPACITOR 16V 47M	1	
C166	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C168,69	QEDC1CM-476Z	E.CAPACITOR 16V 47M	2	
C170,71	NCB21HK-103X	C.CAPACITOR 50V 0.01U	2	
C172	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C173	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C174	QEDC1HM-105Z	E.CAPACITOR 50V 1M	1	
C175	QTP61HM-105Z	E.CAPACITOR 50V 1M	1	
C177	QTP61HM-105Z	E.CAPACITOR 50V 1M	1	
C178	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C179	NDC21HJ-9R0X	C.CAPACITOR 50V 9P	1	
C181	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C182	NDC21HJ-390X	C.CAPACITOR 50V 39P	1	
C184	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C185	NDC21HJ-470X	C.CAPACITOR 50V 47P	1	
C186,87	NCB21HK-103X	C.CAPACITOR 50V 0.01U	2	
C188	NDC21HJ-470X	C.CAPACITOR 50V 47P	1	
C190	NDC21HJ-220X	C.CAPACITOR 50V 22P	1	
C191	NDC21HJ-150X	C.CAPACITOR 50V 15P	1	
C192	NDC21HJ-240X	C.CAPACITOR 50V 24P	1	
C193	NDC21HJ-220X	C.CAPACITOR 50V 22P	1	
C194	NDC21HJ-390X	C.CAPACITOR 50V 39P	1	
C195	NDC21HJ-150X	C.CAPACITOR 50V 15P	1	
C196	NDC21HJ-120X	C.CAPACITOR 50V 12P	1	
C197	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C198	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C199	NDC21HJ-101X	C.CAPACITOR 50V 100P	1	
C200	NDC21HJ-270X	C.CAPACITOR 50V 27P	1	
C201	NDC21HJ-470X	C.CAPACITOR 50V 47P	1	
C203	NDC21HJ-390X	C.CAPACITOR 50V 39P	1	
C204,05	NDC21HJ-180X	C.CAPACITOR 50V 18P	2	
C206,07	NCB21HK-103X	C.CAPACITOR 50V 0.01U	2	
C208	NDC21HJ-820X	C.CAPACITOR 50V 82P	1	
C209,10	QEDC1CM-476Z	E.CAPACITOR 16V 47M	2	
C212	NDC21HJ-391X	C.CAPACITOR 50V 390P	1	
C213	NDC21HJ-560X	C.CAPACITOR 50V 56P	1	
C214	NDC21HJ-331X	C.CAPACITOR 50V 330P	1	
C215	NDC21HJ-121X	C.CAPACITOR 50V 120P	1	
C216	NDC21HJ-560X	C.CAPACITOR 50V 56P	1	
C217	QEDC1HM-105Z	E.CAPACITOR 50 1M	1	
C218	NDC21HJ-151X	C.CAPACITOR 50V 150P	1	
C220	NDC21HJ-561X	C.CAPACITOR 50V 560P	1	
C221	NCB21HK-102X	C.CAPACITOR 50V 1000P	1	
C222-24	NCB21HK-103X	C.CAPACITOR 50V 0.01U	3	
C225	NDC21HJ-560X	C.CAPACITOR 50V 56P	1	
C227	NDC21HJ-100X	C.CAPACITOR 50V 10P	1	
C228	NDC21HJ-330X	C.CAPACITOR 50V 33P	1	
C231	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C232	NCB21EK-104X	C.CAPACITOR 25V 0.1U	1	
C233	NDC21HJ-7R0X	C.CAPACITOR 50V 7P	1	
C234	NDC21HJ-240X	C.CAPACITOR 50V 24P	1	
C235	NDC21HJ-470X	C.CAPACITOR 50V 47P	1	
C236,37	NCB21HK-103X	C.CAPACITOR 50V 0.01U	2	
C238	NDC21HJ-101X	C.CAPACITOR 50V 100P	1	
C251	NDC21HJ-270X	C.CAPACITOR 50V 27P	1	
C252	NDC21HJ-821X	C.CAPACITOR 50V 820P	1	
C253	NCB21HK-473X	C.CAPACITOR 50V 0.047P	1	
C254	NDC21HJ-120X	C.CAPACITOR 50V 12P	1	

Components identified with the mark  have the special characteristics for safety.
When replacing any of these components, use only the same type.

R5				
C256	NDC21HJ-220X	C.CAPACITOR 50V 22P	1	
C263	NDC21HJ-150X	C.CAPACITOR 50V 15P	1	
C264	NCB21EK-104X	C.CAPACITOR 25V 0.1U	1	
C267	NCB21EK-104X	C.CAPACITOR 25V 0.1U	1	
C270	NDC21HJ-331X	C.CAPACITOR 50V 330P	1	
C302	NCB21HK-102X	C.CAPACITOR 50V 1000P	1	
C303	NDC21HJ-100X	C.CAPACITOR 50V 10P	1	
C304	QEDC1HM-475Z	E.CAPACITOR 50V 4.7M	1	
C307	QEDC1CM-476Z	E.CAPACITOR 50V 47M	1	
C308	QEK1CM-227Z	E.CAPACITOR 50V 220M	1	
C309	NCB21EK-104X	C.CAPACITOR 25V 0.1U	1	
C312	NCB21HK-682X	C.CAPACITOR 50V 6800P	1	
C313	NDC21HJ-101X	C.CAPACITOR 50V 100P	1	
C314	QEDC1HM-475Z	E.CAPACITOR 50V 4.7M	1	
C316	QEDC1CM-106Z	E.CAPACITOR 50V 10M	1	
C321	QEDC1CM-476Z	E.CAPACITOR 50V 47M	1	
C322	NCB21EK-104X	C.CAPACITOR 25V 0.1U	1	
C352	NCB21HK-472X	C.CAPACITOR 50V 4700P	1	
C360	NCB21EK-104X	C.CAPACITOR 25V 0.1U	1	
C362	NCB21HK-102X	C.CAPACITOR 50V 1000P	1	
C601	NDC21HJ-150X	C.CAPACITOR 50V 15P	1	
C602	NDC21HJ-120X	C.CAPACITOR 50V 12P	1	
C603	NDC21HJ-100X	C.CAPACITOR 50V 10P	1	
C604	NCB21EK-104X	C.CAPACITOR 25V 0.1U	1	
C605	NCB21HK-223X	C.CAPACITOR 50V 0.022U	1	
C606,07	NCB21HK-103X	C.CAPACITOR 50V 0.01U	2	
C608	QEGR1CM-476Z	E.CAPACITOR 16V 47M	1	
C609-13	NCB21HK-103X	C.CAPACITOR 50V 0.01U	5	
C614	QEHCOJM-337Z	E.CAPACITOR 6.3V 330M	1	
C615	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C616	QEDC1CM-226Z	E.CAPACITOR 16V 22M	1	
C617	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C618	QEDC1CM-226Z	E.CAPACITOR 16V 22M	1	
C621	NCB21HK-473X	C.CAPACITOR 50V 0.047U	1	
C623,24	NDC21HJ-221X	C.CAPACITOR 50V 220P	2	
C625	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C626	QEK1CM-107Z	E.CAPACITOR 16V 100M	1	
C627	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C628	QEDC1AM-336Z	E.CAPACITOR 10V 33M	1	
C629	QEDC1CM-226Z	E.CAPACITOR 16V 22M	1	
C630	QEK1CM-107Z	E.CAPACITOR 16V 100M	1	
C632	QEDC1HM-105Z	E.CAPACITOR 50V 1M	1	
C633	NCB21HK-102X	C.CAPACITOR 50V 1000P	1	
C634	QEP61HM-105Z	E.CAPACITOR 50V 1M	1	
C635	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C636	NCB21HK-222X	C.CAPACITOR 50V 2200P	1	
C637	QEK1CM-107Z	E.CAPACITOR 16V 100M	1	
C638	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C640	QEP61HM-105Z	E.CAPACITOR 50V 1M	1	
C641	QEP61CM-106Z	E.CAPACITOR 16V 10M	1	
C656	NCB21EK-104X	C.CAPACITOR 25V 0.1U	1	
C657	NCB21CK-154X	C.CAPACITOR 16V 0.15U	1	
C658	NCB21EK-563X	C.CAPACITOR 25V 0.056U	1	
C659	QEP61HM-105Z	E.CAPACITOR 50V 1M	1	
C660	NCB21CK-154X	C.CAPACITOR 16V 0.15U	1	
C661	QEDC1CM-107Z	E.CAPACITOR 16V 100M	1	
C662	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C668-70	NDC21HJ-101X	C.CAPACITOR 16V 100P	3	
C671	NDC21HJ-680X	C.CAPACITOR 16V 68P	1	
C672	QEDC1HM-105Z	E.CAPACITOR 50V 1M	1	
C673	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C674,75	NCB21HK-103X	C.CAPACITOR 50V 0.01U	2	
C676	QEGR1CM-476Z	E.CAPACITOR 16V 47M	1	
C677	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C678	NDC21HJ-101X	C.CAPACITOR 50V 100P	1	
C679	NDC21HJ-220X	C.CAPACITOR 50V 22P	1	
C680	NDC21HJ-330X	C.CAPACITOR 50V 33P	1	
C681	NCB21HK-223X	C.CAPACITOR 50V 0.022U	1	
C685,86	NCB21EK-104X	C.CAPACITOR 25V 0.1U	2	
C687,88	NCB21HK-472X	C.CAPACITOR 50V 4700P	2	
C801	NCB21HK-223X	C.CAPACITOR 50V 0.022U	1	
C802	QEDC1CM-106Z	E.CAPACITOR 16V 10M	1	
C803	QEH1CM-107Z	E.CAPACITOR 16V 100M	1	
C804	NCB21HK-223X	C.CAPACITOR 50V 0.022U	1	
C805	NCB21HK-102X	C.CAPACITOR 50V 1000P	1	

C806	QEH1CM-107Z	E.CAPACITOR 16V 100M	1	
C807	QEDC1CM-476Z	E.CAPACITOR 16V 47M	1	
C808	QEH1CM-107Z	E.CAPACITOR 16V 100M	1	
C811,12	NCB21HK-223X	C.CAPACITOR 50V 0.022U	2	
C821,22	NCB21EK-104X	C.CAPACITOR 25V 0.1U	2	
CL1	QZW0035-001	WIRE CLAMP	1	
CN1	PEMC0915-026	CONNECTOR 26P	1	
CN3	QGB2006L1-06	CONNECTOR 3P	1	
CN4	QGB2006L1-08	CONNECTOR 8P	1	
CN301	PEMC0915-017	CONNECTOR 17P	1	
CN601	PEMC0915-113	CONNECTOR 13P	1	
CN602	PEMC0915-115	CONNECTOR 15P	1	
CN603	QGA2001C1-03	CONNECTOR 3P	1	
CN604	PEMC0915-119	CONNECTOR 19P	1	
CN605	SSV1933-12	CONNECTOR 12P	1	
CN606	QGA2001C1-11	CONNECTOR 11P	1	
CN801	PU59555-10	CONNECTOR 10P	1	
 CP601	ICP-N25-T	ICP	1	
 CP801	ICP-N20-T	ICP	1	
 CP802	ICP-N25-T	ICP	1	
D1	1SS355	DIODE	1	
D2	DAP202K	DIODE	1	
D4	RD2.0EB	ZENER DIODE	1	
D5	1SS133	DIODE	1	
D6-11	RD9.1EW	ZENER DIODE	6	
D12	1SS133	DIODE	1	
D13	1SS355	DIODE	1	
D14	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
D20	1SS133	DIODE	1	
D301,02	MA3091	ZENER DIODE	2	
D311,12	MA3091	ZENER DIODE	2	
D321	1SS133	DIODE	1	
D323	1SS133	DIODE	1	
D602,03	1SS133	DIODE	2	
D605,06	1SS133	DIODE	2	
D607,08	11ES2	DIODE	2	
D612-15	MA3091	ZENER DIODE	4	
D616	MA3160-M	DIODE	1	
D617	MA3091	ZENER DIODE	1	
D618-20	MA3160-M	DIODE	3	
D621	MA3091	ZENER DIODE	1	
D622,23	MA3160-M	DIODE	2	
D801	RD5.1JSB1	ZENER DIODE	1	
D802	DAN202K	DIODE	1	
D803	1SS133	DIODE	1	
FL1	QQR1029-001	FL FILTER	1	
FL2	QQR0859-001	FL FILTER	1	
FL3	QQR0858-001	FL FILTER	1	
FL4	QQR1030-001	FL FILTER	1	
IC1	JCP0054	IC	1	
IC2	M62353FP	IC	1	
IC3	NJM431U	IC	1	C0DBEZC00003
IC4	VC2076DP	IC	1	
IC5	HA118092FP1	IC	1	
IC6	C0JBAA000076	IC	1	
IC8	CXL1511M	IC	1	
IC9	NJM2285M	IC	1	
IC10	TC4S71F	IC	1	
IC11	MM1111XF	IC	1	
IC301	NJM2068MD	IC	1	C0ABBB000031
IC601	MN101D02HPE	IC	1	
IC602	BA6418N	IC	1	
IC603	M50253P	IC	1	
IC604	TC4021BF/N/	IC	1	
IC605	M50253P	IC	1	
IC606	TC4021BF/N/	IC	1	
IC607	NM24C04EM8	IC	1	
IC608	MM1290XF	IC	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
J1	QNZ0130-001	BNC CONNECTOR	1	
J2	QND0033-001	S JACK	1	
J301	QNN0283-001	PIN JACK 2PIN	1	
J302	QNZ0231-001	MINI JACK	1	
J601	QNN0298-001	PIN JACK	1	
K301	QQR0678-001Z	FERRITE BEADS	1	
K302	QQR1058-001Z	FERRITE BEADS	1	
K351	QQR0678-001Z	FERRITE BEADS	1	
L1	QQL02BJ-822Z	COIL 8200UH	1	
L2	QQL071J-470Y	COIL 47UH	1	
L4,L5	QQL01BJ-470Z	COIL 47UH	2	
L8,L9	QQL071J-680Y	COIL 68UH	2	
L10-13	QQL01BJ-101Z	COIL 100UH	4	
L14	QQL071J-5R6Y	COIL 5.6UH	1	
L15	QQR0601-001Z	COIL 000UH	1	
L16	QQL01BJ-101Z	COIL 100UH	1	
L22	QQL01BJ-101Z	COIL 100UH	1	
L23	QQL071J-560Y	COIL 56UH	1	
L25	QQL071J-390Y	COIL 39UH	1	
L27	QQL071J-101Y	COIL 100UH	1	
L28	QQL071J-680Y	COIL 68UH	1	
L29	QQL071J-100Y	COIL 10UH	1	
L31,32	QQL01BJ-101Z	COIL 100UH	2	
L33	QQL01BJ-470Z	COIL 47UH	1	
L34	QQL071J-560Y	COIL 56UH	1	
L35	QQL071J-100Y	COIL 10UH	1	
L37	QQL071J-330Y	COIL 33UH	1	
L38	QQL071J-221Y	COIL 220UH	1	
L39	QQL071J-100Y	COIL 10UH	1	
L40	QQL01BJ-101Z	COIL 100UH	1	
L41,42	QQL071J-330Y	COIL 33UH	2	
L43	QQL071J-220Y	COIL 22UH	1	
L44	QQL071J-270Y	COIL 27UH	1	
L47	QQL071J-560Y	COIL 56UH	1	
L48	QQL071J-181Y	COIL 180UH	1	
L50	QQL071J-470Y	COIL 47UH	1	
L55	QQL071J-330Y	COIL 33UH	1	
L56	QQL071J-150Y	COIL 15UH	1	
L60	QQL071J-100Y	COIL 10UH	1	
L61	QQL071J-101Y	COIL 100UH	1	
L62	QQL071J-100Y	COIL 10UH	1	
L311	QQL071J-100Y	COIL 10UH	1	
L321	QQL01BJ-101Z	COIL 100UH	1	
L602	QQL01BJ-100Z	COIL 10UH	1	
L603	QQL01BJ-221Z	COIL 220UH	1	
L604-06	QQL01BJ-101Z	COIL 100UH	3	
L801	QQL112J-101	COIL 100UH	1	
Q2	DTA144EKA	TRANSISTOR	1	
Q3,Q4	DTC144EKA	TRANSISTOR	2	
Q6	A1037AK/QR/	TRANSISTOR	1	
Q7,Q8	DTC144EKA	TRANSISTOR	2	
Q9	DTA144EKA	TRANSISTOR	1	
Q10,11	DTC144EKA	TRANSISTOR	2	
Q12	2SC2412K	TRANSISTOR	1	
Q15	DTC144EKA	TRANSISTOR	1	
Q19	A1037AK/QR/	TRANSISTOR	1	
Q20-23	2SC2412K	TRANSISTOR	4	
Q24,25	A1037AK/QR/	TRANSISTOR	2	
Q26	DTC144EKA	TRANSISTOR	1	
Q32	A1037AK/QR/	TRANSISTOR	1	
Q40	A1037AK/QR/	TRANSISTOR	1	
Q41	DTC144EKA	TRANSISTOR	1	
Q42,43	2SC2412K	TRANSISTOR	2	
Q45	2SC2412K	TRANSISTOR	1	
Q46	A1037AK/QR/	TRANSISTOR	1	
Q47	2SC2412K	TRANSISTOR	1	
Q48	A1037AK/QR/	TRANSISTOR	1	
Q49	2SC2412K	TRANSISTOR	1	
Q50	A1037AK/QR/	TRANSISTOR	1	
Q51	2SC2412K	TRANSISTOR	1	
Q53	2SC2412K	TRANSISTOR	1	
Q54	2SK621	FET	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
Q55	2SC2412K	TRANSISTOR	1	
Q56	2SD602	TRANSISTOR	1	
Q57,58	2SD601A	TRANSISTOR	2	
Q59	2SC2412K	TRANSISTOR	1	
Q60	2SD601A	TRANSISTOR	1	
Q61,62	2SC2412K	TRANSISTOR	2	
Q63	A1037AK/QR/	TRANSISTOR	1	
Q64,65	2SC2412K	TRANSISTOR	2	
Q66	DTC144EKA	TRANSISTOR	1	
Q69,70	DTC144EKA	TRANSISTOR	2	
Q71	A1037AK/QR/	TRANSISTOR	1	
Q73	2SC2412K	TRANSISTOR	1	
Q74	A1037AK/QR/	TRANSISTOR	1	
Q75	2SC2412K	TRANSISTOR	1	
Q76	A1037AK/QR/	TRANSISTOR	1	
Q77,78	2SC2412K	TRANSISTOR	2	
Q80	A1037AK/QR/	TRANSISTOR	1	
Q81-85	2SC2412K	TRANSISTOR	5	
Q86	A1037AK/QR/	TRANSISTOR	1	
Q87	2SC2412K	TRANSISTOR	1	
Q89	2SC2412K	TRANSISTOR	1	
Q91-94	2SC2412K	TRANSISTOR	4	
Q95	DTC144EKA	TRANSISTOR	1	
Q601,02	A1037AK/QR/	TRANSISTOR	2	
Q603	DTC144EKA	TRANSISTOR	1	
Q604	DTA144EKA	TRANSISTOR	1	
Q605,06	DTC144EKA	TRANSISTOR	2	
Q607	2SC2412K	TRANSISTOR	1	
Q609	DTC144EKA	TRANSISTOR	1	
Q801	2SC3616/MLK/	TRANSISTOR	1	
Q802	DTA144EKA	TRANSISTOR	1	
Q803	2SD2166/QRS/	TRANSISTOR	1	
Q804	2SC1740S	TRANSISTOR	1	
Q805	2SD1450	TRANSISTOR	1	
R2	NRSA02J-475X	M.RESISTOR 1/10W 4.7M	1	
R3	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R6	NRSA02J-333X	M.RESISTOR 1/10W 33K	1	
R7	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R9	NRSA02J-472X	M.RESISTOR 1/10W 4.7K	1	
R10	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R11,12	NRSA02J-103X	M.RESISTOR 1/10W 10K	2	
R13	NRSA02J-182X	M.RESISTOR 1/10W 1.8K	1	
R14	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R15	NRSA02J-221X	M.RESISTOR 1/10W 220	1	
R16	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R17	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R19	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R21	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R22,23	NRSA02J-101X	M.RESISTOR 1/10W 100	2	
R26	NRSA02J-123X	M.RESISTOR 1/10W 12K	1	
R27	NRSA02J-223X	M.RESISTOR 1/10W 22K	1	
R28	NRSA02J-684X	M.RESISTOR 1/10W 680K	1	
R30,31	NRSA02J-223X	M.RESISTOR 1/10W 22K	2	
R32	NRSA02J-821X	M.RESISTOR 1/10W 820	1	
R33	NRSA02J-682X	M.RESISTOR 1/10W 6.8K	1	
R34	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R36	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R37	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R38	NRSA02J-471X	M.RESISTOR 1/10W 470	1	
R39	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R40	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R41	NRSA02J-822X	M.RESISTOR 1/10W 8.2K	1	
R42	NRSA02J-273X	M.RESISTOR 1/10W 27K	1	
R44	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R45	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R46	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R48,49	NRSA02J-103X	M.RESISTOR 1/10W 10K	2	
R52	NRSA02J-223X	M.RESISTOR 1/10W 22K	1	
R58	NRSA02J-272X	M.RESISTOR 1/10W 2.7K	1	
R59	NRSA02J-562X	M.RESISTOR 1/10W 5.6K	1	
R61	NRSA02J-162X	M.RESISTOR 1/10W 1.6K	1	
R62	NRSA02J-272X	M.RESISTOR 1/10W 2.7K	1	
R63	NRSA02J-682X	M.RESISTOR 1/10W 6.8K	1	
R64-66	NRSA02J-103X	M.RESISTOR 1/10W 10K	3	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R67,68	NRSA02J-391X	M.RESISTOR 1/10W 390	2	
R69-72	NRSA02J-102X	M.RESISTOR 1/10W 1K	4	
R73,74	NRSA02J-332X	M.RESISTOR 1/10W 3.3K	2	
R75	NRSA02J-471X	M.RESISTOR 1/10W 470	1	
R76	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R77,78	NRSA02J-102X	M.RESISTOR 1/10W 1K	2	
R79	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R80	NRSA02J-162X	M.RESISTOR 1/10W 1.6K	1	
R81	NRSA02J-151X	M.RESISTOR 1/10W 150	1	
R82	NRSA02J-331X	M.RESISTOR 1/10W 330	1	
R83,84	NRSA02J-332X	M.RESISTOR 1/10W 3.3K	2	
R85	NDC21HJ-680X	C.CAPACITOR 50V 68	1	
R86	NRSA02J-272X	M.RESISTOR 1/10W 2.7K	1	
R87	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R88	NRSA02J-823X	M.RESISTOR 1/10W 82K	1	
R89	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R90	NRSA02J-273X	M.RESISTOR 1/10W 27K	1	
R91	NRSA02J-181X	M.RESISTOR 1/10W 180	1	
R92,93	NRSA02J-0R0X	M.RESISTOR 1/10W 0	2	
R95-97	NRSA02J-0R0X	M.RESISTOR 1/10W 0	3	
R99,00	NRSA02J-103X	M.RESISTOR 1/10W 10K	2	
R101	NQR0200-005X	COIL	1	
R102-07	NRSA02J-0R0X	M.RESISTOR 1/10W 0	6	
R108,09	NQR0200-005X	COIL	2	
R110	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R111	NRSA02J-822X	M.RESISTOR 1/10W 8.2K	1	
R112	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R113	NRSA02J-331X	M.RESISTOR 1/10W 330	1	
R114	NRSA02J-122X	M.RESISTOR 1/10W 1.2K	1	
R115	NRSA02J-391X	M.RESISTOR 1/10W 390	1	
R116	NRSA02J-221X	M.RESISTOR 1/10W 220	1	
R117	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R118	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R119	NRSA02J-123X	M.RESISTOR 1/10W 12K	1	
R120	NRSA02J-681X	M.RESISTOR 1/10W 680	1	
R121	NRSA02J-153X	M.RESISTOR 1/10W 15K	1	
R122	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R132	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R134	NRSA02J-823X	M.RESISTOR 1/10W 82K	1	
R135	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R136	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R137	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R155	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R156	NRSA02J-223X	M.RESISTOR 1/10W 22K	1	
R157	NRSA02J-272X	M.RESISTOR 1/10W 2.7K	1	
R158	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R161	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R162	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R163	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R164	NRSA02J-101X	M.RESISTOR 1/10W 100	1	
R165	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R166	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R167	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R168	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R169	NRSA02J-272X	M.RESISTOR 1/10W 2.7K	1	
R170	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R171,72	NRSA02J-473X	M.RESISTOR 1/10W 47K	2	
R173	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R174	NRSA02J-122X	M.RESISTOR 1/10W 1.2K	1	
R175	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R176	NRSA02J-332X	M.RESISTOR 1/10W 3.3K	1	
R177	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R178-80	NRSA02J-102X	M.RESISTOR 1/10W 1K	3	
R181	NRSA02J-101X	M.RESISTOR 1/10W 100	1	
R183	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R184	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R185	NRSA02J-821X	M.RESISTOR 1/10W 820	1	
R186	NRSA02J-223X	M.RESISTOR 1/10W 22K	1	
R187	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R188	NRSA02J-750X	M.RESISTOR 1/10W 750	1	
R189,90	NRSA02J-103X	M.RESISTOR 1/10W 10K	2	
R192-94	NRSA02J-750X	M.RESISTOR 1/10W 750	3	
R195	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R196	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R197	NRSA02J-561X	M.RESISTOR 1/10W 560	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R198	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R200	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R202	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R203	NRSA02J-333X	M.RESISTOR 1/10W 3.3K	1	
R204	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R205	NRSA02J-333X	M.RESISTOR 1/10W 3.3K	1	
R206	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R207	NRSA02J-333X	M.RESISTOR 1/10W 3.3K	1	
R208	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R209	NRSA02J-101X	M.RESISTOR 1/10W 100	1	
R211,12	NRSA02J-102X	M.RESISTOR 1/10W 1K	2	
R213	NRSA02J-473X	M.RESISTOR 1/10W 47K	1	
R214	NRSA02J-153X	M.RESISTOR 1/10W 15K	1	
R215,16	NRSA02J-750X	M.RESISTOR 1/10W 750	2	
R219	NRSA02J-471X	M.RESISTOR 1/10W 470	1	
R221	NRSA02J-183X	M.RESISTOR 1/10W 18K	1	
R222	NRSA02J-392X	M.RESISTOR 1/10W 3.9K	1	
R223	NRSA02J-681X	M.RESISTOR 1/10W 680	1	
R224	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R225	NRSA02J-221X	M.RESISTOR 1/10W 220	1	
R226	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R228	NRSA02J-822X	M.RESISTOR 1/10W 8.2K	1	
R229	NRSA02J-333X	M.RESISTOR 1/10W 33K	1	
R230,31	NRSA02J-471X	M.RESISTOR 1/10W 470	2	
R234	NRSA02J-332X	M.RESISTOR 1/10W 3.3K	1	
R235	NRSA02J-392X	M.RESISTOR 1/10W 3.9K	1	
R236,37	NRSA02J-561X	M.RESISTOR 1/10W 560	2	
R238	NRSA02J-122X	M.RESISTOR 1/10W 1.2K	1	
R239	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R240	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R241	NRSA02J-132X	M.RESISTOR 1/10W 1.3K	1	
R242	NRSA02J-101X	M.RESISTOR 1/10W 100	1	
R243	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R244	NRSA02J-183X	M.RESISTOR 1/10W 18K	1	
R245	NRSA02J-392X	M.RESISTOR 1/10W 3.9K	1	
R246	NRSA02J-182X	M.RESISTOR 1/10W 1.8K	1	
R247	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R248	NRSA02J-471X	M.RESISTOR 1/10W 470	1	
R249	NRSA02J-562X	M.RESISTOR 1/10W 5.6K	1	
R250	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R251	NRSA02J-821X	M.RESISTOR 1/10W 820	1	
R252	NRSA02J-681X	M.RESISTOR 1/10W 680	1	
R253	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R254	NRSA02J-511X	M.RESISTOR 1/10W 510	1	
R255	NRSA02J-273X	M.RESISTOR 1/10W 27K	1	
R256	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R258	NRSA02J-331X	M.RESISTOR 1/10W 330	1	
R259	NRSA02J-562X	M.RESISTOR 1/10W 5.6K	1	
R260	NRSA02J-392X	M.RESISTOR 1/10W 3.9K	1	
R261	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R262	NRSA02J-682X	M.RESISTOR 1/10W 6.8K	1	
R264	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R265	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R266,67	NRSA02J-0R0X	M.RESISTOR 1/10W 0	2	
R268-71	NRSA02J-223X	M.RESISTOR 1/10W 22K	4	
R272	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R273	NRSA02J-101X	M.RESISTOR 1/10W 100	1	
R274	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R275	NRSA02J-333X	M.RESISTOR 1/10W 33K	1	
R276	NRSA02J-105X	M.RESISTOR 1/10W 1M	1	
R277-79	NRSA02J-561X	M.RESISTOR 1/10W 560	3	
R280,81	NRSA02J-560X	M.RESISTOR 1/10W 56	2	
R282,83	NRSA02J-102X	M.RESISTOR 1/10W 1K	2	
R284	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R288	NRSA02J-564X	M.RESISTOR 1/10W 560K	1	
R291,92	NRSA02J-0R0X	M.RESISTOR 1/10W 0	2	
R294	NRSA02J-563X	M.RESISTOR 1/10W 56K	1	
R295	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R297	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R299	NRSA02J-101X	M.RESISTOR 1/10W 100	1	
R302	NRSA02J-393X	M.RESISTOR 1/10W 39K	1	
R303	NRSA02J-153X	M.RESISTOR 1/10W 15K	1	
R304	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R306	NRSA02J-473X	M.RESISTOR 1/10W 47K	1	
R307	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R308,09	NRSA02J-103X	M.RESISTOR 1/10W 10K	2	
R312	NRSA02J-332X	M.RESISTOR 1/10W 3.3K	1	
R313	NRSA02J-392X	M.RESISTOR 1/10W 3.9K	1	
R314	NRSA02J-224X	M.RESISTOR 1/10W 220K	1	
R315	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R316	NRSA02J-473X	M.RESISTOR 1/10W 47K	1	
R317	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R320-22	NRSA02J-0R0X	M.RESISTOR 1/10W 0	3	
R323	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R325	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R352,53	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	2	
R601	NRSA02J-221X	M.RESISTOR 1/10W 220	1	
R602	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R603	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R604	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R605-10	NRSA02J-102X	M.RESISTOR 1/10W 1K	6	
R611,12	NRSA02J-0R0X	M.RESISTOR 1/10W 0	2	
R613,14	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	2	
R615	NRSA02J-472X	M.RESISTOR 1/10W 4.7K	1	
R616	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R617	NRSA02J-104X	M.RESISTOR 1/10W 100K	1	
R618	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R619-22	NRSA02J-102X	M.RESISTOR 1/10W 1K	4	
R623-25	NRSA02J-103X	M.RESISTOR 1/10W 10K	3	
R627	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R628-30	NRSA02J-472X	M.RESISTOR 1/10W 4.7K	3	
R632	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R633,34	NRSA02J-102X	M.RESISTOR 1/10W 1K	2	
R636	NRSA02J-105X	M.RESISTOR 1/10W 1M	1	
R637	NRSA02J-332X	M.RESISTOR 1/10W 3.3K	1	
R638	NRSA02J-104X	M.RESISTOR 1/10W 100K	1	
R640	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R641	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R642	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R644	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R645	NRSA02J-681X	M.RESISTOR 1/10W 680	1	
R646-49	NRSA02J-102X	M.RESISTOR 1/10W 1K	4	
R650	NRSA02J-101X	M.RESISTOR 1/10W 100	1	
R651	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R652	NRSA02J-272X	M.RESISTOR 1/10W 2.7K	1	
R653	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R655	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R657	NRSA02J-331X	M.RESISTOR 1/10W 330	1	
R659	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R668	NRSA02J-104X	M.RESISTOR 1/10W 100K	1	
R669	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R673	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R674	NRSA02J-472X	M.RESISTOR 1/10W 4.7K	1	
R675	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R676	NRSA02J-123X	M.RESISTOR 1/10W 12K	1	
R677	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R678	NRSA02J-272X	M.RESISTOR 1/10W 2.7K	1	
R679,80	NRSA02J-0R0X	M.RESISTOR 1/10W 0	2	
R690	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R692	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R697-02	NRSA02J-103X	M.RESISTOR 1/10W 10K	6	
R703	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R704	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R707	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R708	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R711	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R713,14	NRSA02J-103X	M.RESISTOR 1/10W 10K	2	
R715	NRSA02J-562X	M.RESISTOR 1/10W 5.6K	1	
R716-21	NRSA02J-103X	M.RESISTOR 1/10W 10K	6	
R722-25	NRSA02J-101X	M.RESISTOR 1/10W 100	4	
R726-31	NRSA02J-103X	M.RESISTOR 1/10W 10K	6	
R732,33	NRSA02J-101X	M.RESISTOR 1/10W 100	2	
R734-37	NRSA02J-103X	M.RESISTOR 1/10W 10K	4	
R738,39	NRSA02J-101X	M.RESISTOR 1/10W 100	2	
R740-43	NRSA02J-103X	M.RESISTOR 1/10W 10K	4	
R744,45	NRSA02J-102X	M.RESISTOR 1/10W 1K	2	
R746-49	NRSA02J-101X	M.RESISTOR 1/10W 100	4	
R750-53	NRSA02J-102X	M.RESISTOR 1/10W 1K	4	
R754,55	NRSA02J-103X	M.RESISTOR 1/10W 10K	2	
R756-62	NRSA02J-102X	M.RESISTOR 1/10W 1K	7	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R763,64	NRSA02J-103X	M.RESISTOR 1/10W 10K	2	
R765	NRSA02J-223X	M.RESISTOR 1/10W 22K	1	
R766	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R767	NRSA02J-223X	M.RESISTOR 1/10W 22K	1	
R768-72	NRSA02J-103X	M.RESISTOR 1/10W 10K	5	
R773-76	NRSA02J-102X	M.RESISTOR 1/10W 1K	4	
R777	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R778	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R779	NRSA02J-332X	M.RESISTOR 1/10W 3.3K	1	
R780	NRSA02J-101X	M.RESISTOR 1/10W 100	1	
R781	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R782	NRSA02J-472X	M.RESISTOR 1/10W 4.7K	1	
R783	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R791	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R792	QRE141J-562	M.RESISTOR 1/10W 5.6K	1	
R801	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R802	NRSA02J-473X	M.RESISTOR 1/10W 47K	1	
R803-06	NRSA02J-471X	M.RESISTOR 1/10W 470	4	
R807	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R808	NRSA02J-101X	M.RESISTOR 1/10W 100	1	
R809	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R810	NRSA02J-473X	M.RESISTOR 1/10W 47K	1	
R811	NRSA02J-333X	M.RESISTOR 1/10W 33K	1	
R812	NRSA02J-221X	M.RESISTOR 1/10W 220	1	
R901	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R902	NRSA02J-181X	M.RESISTOR 1/10W 180	1	
R903	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R904	NRSA02J-333X	M.RESISTOR 1/10W 33K	1	
R905	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R906	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R908,09	NRSA02J-102X	M.RESISTOR 1/10W 1K	2	
R910	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R911	NRSA02J-432X	M.RESISTOR 1/10W 4.3K	1	
R912	NRSA02J-821X	M.RESISTOR 1/10W 820	1	
R913	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R915	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R916,17	NRSA02J-0R0X	M.RESISTOR 1/10W 0	2	
R918	QRE141J-361Y	C.RESISTOR 1/4W 360	1	
R929	QRE141J-182Y	C.RESISTOR 1/4W 1.8K	1	
R930	NRSA02J-182X	M.RESISTOR 1/10W 1.8K	1	
R932	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R940	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R952-56	NRSA02J-104X	M.RESISTOR 1/10W 100K	5	
R957	QRE141J-335Y	C.RESISTOR 1/4W 3.3M	1	
RL1	QSK0035-005	RELAY	1	
TB601	SQM002-001Z	TERMINAL	1	
TH601	QAD0006-102	THERMISTOR	1	
TP2	QNZ0091-001Z	TEST POINT	1	
TP6	NNZ0022-001X	TEST POINT	1	
TP613	NNZ0022-001X	TEST POINT	1	
TP622	NNZ0022-001X	TEST POINT	1	
TP624	QNZ0091-001Z	TEST POINT	1	
VR2	QVPB609-202Z	V.RESISTOR 2K	1	
VR4	QVPB609-202Z	TRIM.RESISTOR	1	
X1	PEVB0386	CRYSTAL	1	
X601	QAX0522-001	CRYSTAL	1	
X602	QAX0520-001	CRYSTAL	1	
E3	SLK112306B0B	COMB MIX C.B.A.	1 (RTL)	
B101	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
C21	NDC21HJ-101X	C.CAPACITOR 50V 100P	1	
C114	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
C116	NDC21HJ-150X	C.CAPACITOR 50V 15P	1	
C117-19	NCB21HK-103X	C.CAPACITOR 50V 0.01U	3	
C130	NDC21HJ-5R0X	C.CAPACITOR 50V 5P	1	
C131,32	NDC21HJ-560X	C.CAPACITOR 50V 56P	2	
C133	NDC21HJ-680X	C.CAPACITOR 50V 68P	1	
C134	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C135	NCB21HK-102X	C.CAPACITOR 50V 1000P	1	
C136	NDC21HJ-150X	C.CAPACITOR 50V 15P	1	
C137	NDC21HJ-5R0X	C.CAPACITOR 50V 5P	1	
C138	NDC21HJ-150X	C.CAPACITOR 50V 15P	1	
C139	NCB21HK-473X	C.CAPACITOR 50V 0.047U	1	
C239	NDC21HJ-151X	C.CAPACITOR 50V 150P	1	
C241	QEGR1VM-106Z	E.CAPACITOR 50V 10M	1	
C242	NDC21HJ-330X	C.CAPACITOR 50V 33P	1	
C260	NDC21HJ-330X	C.CAPACITOR 50V 33P	1	
C261	NCB21HK-473X	C.CAPACITOR 50V 0.047U	1	
CN3	QGB2006M1-06	CONNECTOR 6P	1	
CN4	QGB2006M1-08	CONNECTOR 8P	1	
L17	QQL071J-330Y	COIL 33UH	1	
L18	QQL071J-820Y	COIL 82UH	1	
L19,20	QQL071J-680Y	COIL 68UH	2	
L51	QQL071J-101Y	COIL 100UH	1	
L59	QQL071J-390Y	COIL 39UH	1	
Q27	2SC2412K	TRANSISTOR	1	
Q28	DTC144EKA	TRANSISTOR	1	
Q29,30	A1037AK/QR/	TRANSISTOR	2	
Q31	2SC2412K	TRANSISTOR	1	
Q33	2SC2412K	TRANSISTOR	1	
Q35	2SC2412K	TRANSISTOR	1	
Q37-39	2SC2412K	TRANSISTOR	3	
Q96	2SC2412K	TRANSISTOR	1	
Q97,98	A1037AK/QR/	TRANSISTOR	2	
R123	NRSA02J-223X	M.RESISTOR 1/10W 22K	1	
R124	NRSA02J-153X	M.RESISTOR 1/10W 15K	1	
R125	NRSA02J-751X	M.RESISTOR 1/10W 750	1	
R126	NRSA02J-681X	M.RESISTOR 1/10W 680	1	
R127	NRSA02J-333X	M.RESISTOR 1/10W 33K	1	
R128	NRSA02J-562X	M.RESISTOR 1/10W 5.6K	1	
R129	NRSA02J-681X	M.RESISTOR 1/10W 680	1	
R130	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R131	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R138	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R139	NRSA02J-221X	M.RESISTOR 1/10W 220	1	
R140	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R142	NRSA02J-153X	M.RESISTOR 1/10W 15K	1	
R144	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R146	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R147,48	NRSA02J-112X	M.RESISTOR 1/10W 1.1K	2	
R149	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R150	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R151	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R152	NRSA02J-472X	M.RESISTOR 1/10W 4.7K	1	
R154	NRSA02J-272X	M.RESISTOR 1/10W 2.7K	1	
R199	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R287	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R921	NRSA02J-333X	M.RESISTOR 1/10W 33K	1	
R922	NRSA02J-153X	M.RESISTOR 1/10W 15K	1	
R923-26	NRSA02J-102X	M.RESISTOR 1/10W 1K	4	
R928	NRSA02J-332X	M.RESISTOR 1/10W 3.3K	1	
R951	NRSA02J-681X	M.RESISTOR 1/10W 680	1	
■ E4	PB2066A-02	A/C HEAD C.B.A.	1 (RTL)	
CN1	PU60910-107	CONNECTOR 7P	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
■ E5	SLK112303C0B	FRONT 1 C.B.A.	1 (RTL)	
C1	NCB21EK-104X	C.CAPACITOR 25V 0.1U	1	
C2	QEK1CM-476Z	E.CAPACITOR 16V 47M	1	
C3	QEK1CM-106Z	E.CAPACITOR 50V 10M	1	
C4	NCB21HK-102X	C.CAPACITOR 50V 1000P	1	
C5,C6	NCB21HK-473X	C.CAPACITOR 50V 0.047U	2	
C7	NDC21HJ-330X	C.CAPACITOR 50V 33P	1	
C8	NDC21HJ-101X	C.CAPACITOR 50V 100P	1	
C10	NDC21HJ-101X	C.CAPACITOR 50V 100P	1	
CN1	PEMC0915-113	CONNECTOR 13P	1	
CN2	QGA2001C1-07	CONNECTOR 7P	1	
D1	11ES2	DIODE	1	
D2	SLR-56VR3F	LED	1	
D4	SLR-56VR3F	LED	1	
D5	RD4.7ES/B2/	ZENER DIODE	1	
D11-17	1SS133	DIODE	7	
FDP1	PGZ02035	FDP	1	
FDP2	PQ34951	FDP HOLDER (L)	1	
FDP3	PQ34952	FDP HOLDER (R)	1	
HD1	PQ43191	LED HOLDER	1	
IC1	UPD16311GC	IC	1	
L1	QQL01BJ-101Z	COIL 100UH	1	
R1	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R2	NRSA02J-331X	M.RESISTOR 1/10W 330	1	
R4	NRSA02J-331X	M.RESISTOR 1/10W 330	1	
R5	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R7-10	NRSA02J-272X	M.RESISTOR 1/10W 2.7K	4	
R11,12	NRSA02J-561X	M.RESISTOR 1/10W 560	2	
R13	NRSA02J-563X	M.RESISTOR 1/10W 56K	1	
R14	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R15	NRSA02J-272X	M.RESISTOR 1/10W 2.7K	1	
R21-28	NRSA02J-333X	M.RESISTOR 1/10W 33K	8	
S2	QSW0381-001Z	SWITCH	1	
■ E6	SLK112304C0A	FRONT 2 C.B.A.	1 (RTL)	
CN101	QGA2001C1-07	CONNECTOR 7P	1	
D104	SLR-56VR3F	LED	1	
HD1	PQ43191	LED HOLDER	1	
R104	QRE141J-331Y	C.RESISTOR	1	
S103	QSW0381-001Z	SWITCH	1	
■ E7	SLK112302C0B	P/R C.B.A.	1 (RTL)	
B400	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
C1-C4	NCB21HK-103X	C.CAPACITOR 50V 0.01U	4	
C6-C8	NCB21HK-103X	C.CAPACITOR 50V 0.01U	3	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
C10	NDC21HJ-821X	C.CAPACITOR 50V 820P	1	
C11-14	NCB21HK-103X	C.CAPACITOR 50V 0.01U	4	
C16-23	NCB21HK-103X	C.CAPACITOR 50V 0.01U	8	
C24-28	NCB21EK-104X	C.CAPACITOR 25V 0.1U	5	
C29	NCF21CZ-224X	C.CAPACITOR 16V 0.22U	1	
C30	NDC21HJ-390X	C.CAPACITOR 50V 39P	1	
C31	NCF21CZ-224X	C.CAPACITOR 16V 0.22U	1	
C32	NDC21HJ-470X	C.CAPACITOR 50V 47P	1	
C33,34	NCB21EK-104X	C.CAPACITOR 25V 0.1U	2	
C35	NDC21HJ-330X	C.CAPACITOR 50V 33P	1	
C36	NCF21CZ-224X	C.CAPACITOR 16V 0.22U	1	
C37	NDC21HJ-270X	C.CAPACITOR 50V 27P	1	
C38	NCF21CZ-224X	C.CAPACITOR 16V 0.22U	1	
C39	NCB21EK-104X	C.CAPACITOR 25V 0.1U	1	
C40	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C41	NCB21HK-223X	C.CAPACITOR 50V 0.022U	1	
C42	QEGR1CM-476Z	E.CAPACITOR 16V 47M	1	
C43	NCB21HK-223X	C.CAPACITOR 50V 0.022U	1	
C44	QEGR1CM-476Z	E.CAPACITOR 16V 47M	1	
C45	NDC21HJ-270X	C.CAPACITOR 50V 27P	1	
C48	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C49	NCF21CZ-334X	C.CAPACITOR 16V 0.22U	1	
C50	NDC21HJ-100X	C.CAPACITOR 50V 10P	1	
C51	NCB21AK-105X	C.CAPACITOR 10V 1U	1	
C52	QEGR1CM-476Z	E.CAPACITOR 16V 47M	1	
C53	NCB21HK-223X	C.CAPACITOR 50V 0.022U	1	
C54	QER61HM-105Z	E.CAPACITOR 50V 1M	1	
C55	NCB21HK-223X	C.CAPACITOR 50V 0.022U	1	
C56	NDC21HJ-151X	E.CAPACITOR 50V 150P	1	
C57	NDC21HJ-8R0X	E.CAPACITOR 50V 8P	1	
C58	NDC21HJ-391X	E.CAPACITOR 50V 390P	1	
C59	NDC21HJ-120X	E.CAPACITOR 50V 12P	1	
C61	NCB21EK-104X	C.CAPACITOR 25V 0.1U	1	
C63	NDC21HJ-200X	C.CAPACITOR 50V 20P	1	
C64	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C66	NCB21EK-104X	C.CAPACITOR 25V 0.1U	1	
C67,68	NCB21HK-103X	C.CAPACITOR 50V 0.01U	2	
C70	NDC21HJ-101X	C.CAPACITOR 50V 100P	1	
C71	NDC21HJ-331X	C.CAPACITOR 50V 330P	1	
C72	NDC21HJ-470X	C.CAPACITOR 50V 47P	1	
C73	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C79,80	NCB21HK-103X	C.CAPACITOR 50V 0.01U	2	
C81	NDC21HJ-821X	C.CAPACITOR 50V 820P	1	
C82	QEGR1CM-476Z	E.CAPACITOR 16V 47M	1	
C83	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C84	NDC21HJ-121X	C.CAPACITOR 50V 120P	1	
C85	NDC21HJ-181X	C.CAPACITOR 50V 180P	1	
C86	NCB21HK-102X	C.CAPACITOR 50V 1000P	1	
C87	NCB21HK-223X	C.CAPACITOR 50V 0.022U	1	
C88	QEGR1CM-226Z	E.CAPACITOR 16V 22M	1	
C89	NDC21HJ-150X	C.CAPACITOR 50V 15P	1	
C90	NCB21EK-104X	C.CAPACITOR 25V 0.1U	1	
C91	NDC21HJ-9R0X	C.CAPACITOR 50V 9P	1	
C101	NDC21HJ-680X	C.CAPACITOR 50V 68P	1	
C102	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C301	QTNC1HM-105Z	E.CAPACITOR 50V 1M	1	
C302	NDC21HJ-101X	C.CAPACITOR 50V 100P	1	
C303	QEDC1HM-475Z	E.CAPACITOR 50V 1M	1	
C304	QEDC1CM-226Z	E.CAPACITOR 16V 22M	1	
C305	QTNC1HM-105Z	E.CAPACITOR 50V 1M	1	
C306-09	NDC21HJ-101X	C.CAPACITOR 50V 100P	4	
C310	QEDC1CM-106Z	E.CAPACITOR 16V 10M	1	
C313	NCB21HK-393X	C.CAPACITOR 50V 0.039U	1	
C314	NCB21HK-333X	C.CAPACITOR 50V 0.033U	1	
C315	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C316	NCB21HK-472X	C.CAPACITOR 50V 4700P	1	
C318	QEDC1HM-105Z	E.CAPACITOR 50V 1M	1	
C331	NCB21HK-681X	C.CAPACITOR 50V 680P	1	
C332	NCB21HK-222X	C.CAPACITOR 50V 2200P	1	
C333	QEDC1HM-475Z	E.CAPACITOR 50V 4.7M	1	
C334	NCB21HK-123X	C.CAPACITOR 50V 0.012U	1	
C335	QEDC1HM-475Z	E.CAPACITOR 50V 4.7M	1	
C336	NCB21HK-471X	C.CAPACITOR 50V 470P	1	
C337	QEDC1CM-106Z	E.CAPACITOR 16V 10M	1	
C338	NCB21HK-562X	C.CAPACITOR 50V 5600P	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
C353	QEDC1HM-105Z	E.CAPACITOR 50V 1M	1	
C354	QEHC1CM-107Z	E.CAPACITOR 16V 1000M	1	
C361	NCB21HK-223X	C.CAPACITOR 50V 0.022U	1	
C362	NCB21HK-472X	C.CAPACITOR 50V 4700P	1	
C363	QEDC1CM-106Z	E.CAPACITOR 16V 10M	1	
C364	QFN31HJ-823Z	E.CAPACITOR 50V 0.082M	1	
C365,66	NCB21HK-681X	C.CAPACITOR 50V 680P	2	
CN1	PEMC0915-126	CONNECTOR 26P	1	
CN2	PU59974-8	CONNECTOR 8P	1	
CN301	PEMC0915-117	CONNECTOR 17P	1	
CN302	QGD2001C1-04	CONNECTOR 4P	1	
CN303	QGD2001C1-02	CONNECTOR 2P	1	
CN401	QGD2001C1-02	CONNECTOR 2P	1	
D1-D4	DAN202K	DIODE	4	
D5	1SS355	DIODE	1	
D6	1S2076A	DIODE	1	
D7,D8	1SS355	DIODE	2	
D10	1S2076A	DIODE	1	
D351	1SS133	DIODE	1	
IC1	HA118191ANT	IC	1	
IC301	BA7765AS	IC	1	
IC331	TC4S66F	IC	1	C0JBAS000050
L1,L2	QQL071J-221Y	COIL 220UH	2	
L3	QQL071J-100Y	COIL 10UH	1	
L4-L6	QQL01BJ-101Z	COIL 100UH	3	
L8	QQL071J-221Y	COIL 220UH	1	
L9	QQL071J-150Y	COIL 15UH	1	
L10	QQL071J-151Y	COIL 150UH	1	
L13	QQL071J-150Y	COIL 15UH	1	
L15	QQL071J-101Y	COIL 100UH	1	
L16	QQL01BJ-101Z	COIL 100UH	1	
L18	QQL071J-390Y	COIL 39UH	1	
L19	QQL071J-181Y	COIL 180UH	1	
L20	QQL071J-270Y	COIL 27UH	1	
L311	QQL25CJ-123Z	COIL 12MH	1	
L312	QQL01BJ-221Z	COIL	1	
Q1-Q4	2SC2412K	TRANSISTOR	4	
Q5	DTC144EKA	TRANSISTOR	1	
Q6-Q9	A1037AK/QR/	TRANSISTOR	4	
Q10,11	DTC144EKA	TRANSISTOR	2	
Q12	2SC2412K	TRANSISTOR	1	
Q13	DTC144EKA	TRANSISTOR	1	
Q14	2SC2412K	TRANSISTOR	1	
Q16	2SC2412K	TRANSISTOR	1	
Q21	A1037AK/QR/	TRANSISTOR	1	
Q22	2SK433	FET	1	
Q23,24	2SC2412K	TRANSISTOR	2	
Q25	A1037AK/QR/	TRANSISTOR	1	
Q26	2SC2412K	TRANSISTOR	1	
Q30,31	2SC2412K	TRANSISTOR	2	
Q32	DTC144EKA	TRANSISTOR	1	
Q33	DTA144EKA	TRANSISTOR	1	
Q34-36	DTC144EKA	TRANSISTOR	3	
Q41	DTC144EKA	TRANSISTOR	1	
Q311	DTA144EKA	TRANSISTOR	1	
Q312	DTC144EKA	TRANSISTOR	1	
Q361	2SC2412K	TRANSISTOR	1	
R1,R2	NRSA02J-123X	M.RESISTOR 1/10W 12K	2	
R4,R5	NRSA02J-333X	M.RESISTOR 1/10W 33K	2	
R6-R9	NRSA02J-122X	M.RESISTOR 1/10W 1.2K	4	
R10	NRSA02J-471X	M.RESISTOR 1/10W 470	1	
R11,12	NQR0155-004X	FILTER	2	
R13	NRSA02J-471X	M.RESISTOR 1/10W 470	1	
R14	NRSA02J-472X	M.RESISTOR 1/10W 4.7K	1	
R15	NRSA02J-121X	M.RESISTOR 1/10W 120	1	
R16	NRSA02J-331X	M.RESISTOR 1/10W 330	1	
R17,18	NQR0155-004X	FILTER	2	
R19	NRSA02J-120X	M.RESISTOR 1/10W 12	1	
R20	NRSA02J-131X	M.RESISTOR 1/10W 130	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R21	NRSA02J-820X	M.RESISTOR 1/10W 82	1	
R22	NRSA02J-471X	M.RESISTOR 1/10W 470	1	
R23	NRSA02J-820X	M.RESISTOR 1/10W 82	1	
R25	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R26	NRSA02J-393X	M.RESISTOR 1/10W 39K	1	
R27	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R28	NRSA02J-123X	M.RESISTOR 1/10W 12K	1	
R29	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R30	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R31	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R32	NRSA02J-822X	M.RESISTOR 1/10W 8.2K	1	
R33	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R35	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R36	NRSA02J-821X	M.RESISTOR 1/10W 820	1	
R38	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R39	NRSA02J-393X	M.RESISTOR 1/10W 39K	1	
R40,41	NRSA02J-473X	M.RESISTOR 1/10W 47K	2	
R42	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R43	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R45	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R50	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R52	NRSA02J-681X	M.RESISTOR 1/10W 680	1	
R53	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R54	NRSA02J-333X	M.RESISTOR 1/10W 33K	1	
R55	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R56	NRSA02J-682X	M.RESISTOR 1/10W 6.8K	1	
R57	NRSA02J-105X	M.RESISTOR 1/10W 1M	1	
R58	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R59	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R60	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R61	NRSA02J-122X	M.RESISTOR 1/10W 1.2K	1	
R62	NRSA02J-182X	M.RESISTOR 1/10W 1.8K	1	
R63	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R65	NRSA02J-332X	M.RESISTOR 1/10W 3.3K	1	
R66	NRSA02J-301X	M.RESISTOR 1/10W 300	1	
R67	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R68	NRSA02J-332X	M.RESISTOR 1/10W 3.3K	1	
R69	NRSA02J-681X	M.RESISTOR 1/10W 680	1	
R70	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R71	NRSA02J-822X	M.RESISTOR 1/10W 8.2K	1	
R72	NRSA02J-222X	M.RESISTOR 1/10W 2.2K	1	
R80	NRSA02J-332X	M.RESISTOR 1/10W 3.3K	1	
R81	NRSA02J-123X	M.RESISTOR 1/10W 12K	1	
R82	NRSA02J-822X	M.RESISTOR 1/10W 8.2K	1	
R83	NRSA02J-270X	M.RESISTOR 1/10W 27	1	
R84	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R85	NRSA02J-221X	M.RESISTOR 1/10W 220	1	
R86	NRSA02J-331X	M.RESISTOR 1/10W 330	1	
R87	NRSA02J-681X	M.RESISTOR 1/10W 680	1	
R88	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R89	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R90	NRSA02J-562X	M.RESISTOR 1/10W 5.6K	1	
R91	NRSA02J-333X	M.RESISTOR 1/10W 33K	1	
R92	NRSA02J-471X	M.RESISTOR 1/10W 470	1	
R93	NRSA02J-472X	M.RESISTOR 1/10W 4.7K	1	
R94	NRSA02J-681X	M.RESISTOR 1/10W 680	1	
R101	NRSA02J-331X	M.RESISTOR 1/10W 330	1	
R301	NRSA02J-223X	M.RESISTOR 1/10W 22K	1	
R302	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R303	NRSA02J-472X	M.RESISTOR 1/10W 4.7K	1	
R304	NRSA02J-223X	M.RESISTOR 1/10W 22K	1	
R305	NRSA02J-474X	M.RESISTOR 1/10W 470K	1	
R306	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R307,08	NRSA02J-104X	M.RESISTOR 1/10W 100K	2	
R309	NRSA02J-513X	M.RESISTOR 1/10W 51K	1	
R311	NRSA02J-392X	M.RESISTOR 1/10W 3.9K	1	
R312	NRSA02J-152X	M.RESISTOR 1/10W 1.5K	1	
R315	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R316	NRSA02J-681X	M.RESISTOR 1/10W 680	1	
R317	NRSA02J-821X	M.RESISTOR 1/10W 820	1	
R318	NRSA02J-561X	M.RESISTOR 1/10W 560	1	
R321	NRSA02J-822X	M.RESISTOR 1/10W 8.2K	1	
R322	NRSA02J-223X	M.RESISTOR 1/10W 22K	1	
R331	NRSA02J-100X	M.RESISTOR 1/10W 10	1	
R332	NRSA02J-273X	M.RESISTOR 1/10W 27K	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R334	NRSA02J-274X	M.RESISTOR 1/10W 270K	1	
R335	NRSA02J-511X	M.RESISTOR 1/10W 510	1	
R336	NRSA02J-562X	M.RESISTOR 1/10W 5.6K	1	
R337	NRSA02J-392X	M.RESISTOR 1/10W 3.9K	1	
R338	NRSA02J-823X	M.RESISTOR 1/10W 82K	1	
R339	NRSA02J-154X	M.RESISTOR 1/10W 150K	1	
R340	NRSA02J-473X	M.RESISTOR 1/10W 47K	1	
R341	NRSA02J-102X	M.RESISTOR 1/10W 1K	1	
R342	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R351	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
R354	NRSA02J-103X	M.RESISTOR 1/10W 10K	1	
R357	NRSA02J-223X	M.RESISTOR 1/10W 22K	1	
R358,59	NRSA02J-103X	M.RESISTOR 1/10W 10K	2	
R361	NRSA02J-3R3X	M.RESISTOR 1/10W 3.3	1	
R362	NRSA02J-123X	M.RESISTOR 1/10W 12K	1	
R363	QRZ9005-220X	M.RESISTOR 22	1	
R364	NRSA02J-472X	M.RESISTOR 1/10W 4.7K	1	
R365	QRE141J-0R0Y	M.RESISTOR 1/4W 0	1	
R366	NRSA02J-332X	M.RESISTOR 1/10W 3.3K	1	
R367	QRE141J-0R0Y	M.RESISTOR 1/4W 0	1	
R368	NRSA02J-273X	M.RESISTOR 1/10W 27K	1	
T301	PELN0832	BIAS OSC.COIL	1	
TP1	QNZ0091-001Z	TEST POINT	1	
■ E8	SLK110901S0B	DECK TERMINAL C.B.A.	1 (RTL)	
B301	NRSA02J-0R0X	M.RESISTOR 1/10W 0	1	
C601-04	NBE21CM-225X	T.CAPACITOR 16V 2.2U	4	
C605,06	NCB21HK-103X	C.CAPACITOR 50V 0.01U	2	
C607	NDC21HJ-6R0X	C.CAPACITOR 50V 6P	1	
C608	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C609	NDC21HJ-6R0X	C.CAPACITOR 50V 6P	1	
C610	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C613	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C621	NCB21HK-103X	C.CAPACITOR 50V 0.01U	1	
C626,27	NCB21HK-103X	C.CAPACITOR 50V 0.01U	2	
C628,29	NCF21CZ-334X	C.CAPACITOR 16V 0.33U	2	
CN1	PEMC0915-115	CONNECTOR 15P	1	
CN2	PU61434-1-1	CONNECTOR 5P	1	
CN3	QGA2001F1-02	CONNECTOR 2P	1	
CN4	QGF1009F2-12	CONNECTOR 12P	1	
CN5	QGA2001F1-05	CONNECTOR 5P	1	
CN6	PEMC0915-119	CONNECTOR 19P	1	
CN7	QGA2001F1-03	CONNECTOR 3P	1	
D1	SIR-381SB3FX	LE.DIODE	1	
IC601	M5218AFP	IC	1	
IC602	BA10393F	IC	1	
IC605	BA10393F	IC	1	
IC608	TC7W74F	IC	1	
PS1,S2	PU61433	REEL SENSOR	2	
Q1,Q2	LP40038-001A	TRANSISTOR	2	
R2	NRSA02J-223X	M.RESISTOR 1/10W 22K	1	
R4	NRSA02J-223X	M.RESISTOR 1/10W 22K	1	
R5,R6	QRE141J-151Y	M.RESISTOR 1/4W 150	2	
R7,R8	NRSA02J-221X	M.RESISTOR 1/10W 220	2	
R602	NRSA02J-472X	M.RESISTOR 1/10W 4.7K	1	
R603,04	NRSA02J-103X	M.RESISTOR 1/10W 10K	2	
R605	NRSA02J-474X	M.RESISTOR 1/10W 470K	1	
R607	NRSA02J-472X	M.RESISTOR 1/10W 4.7K	1	
R608,09	NRSA02J-103X	M.RESISTOR 1/10W 10K	2	
R610	NRSA02J-474X	M.RESISTOR 1/10W 470K	1	

SECTION 3 ELECTRICAL ADJUSTMENTS

3.1 PRECAUTIONS BEFORE PROCEEDING TO ELECTRICAL ADJUSTMENTS

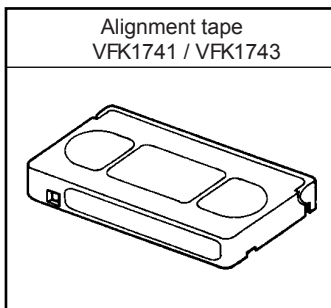
- (1) Before performing an electrical adjustment, make sure that the target point for the adjustment really is deviated and actually requires adjustment.
- (2) Ensure that the mechanism interchangeability adjustments have been completed before proceeding to electrical adjustments.
- (3) Before proceeding to electrical adjustments, leave the unit ON for more than 5 minutes after turning the power ON.
- (4) Use a 10:1 probe with the oscilloscope unless otherwise specified.

3.2 EQUIPMENT REQUIRED FOR ELECTRICAL ADJUSTMENTS

3.2.1 Measuring Instruments Required for Adjustments

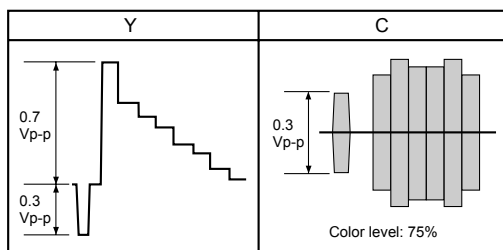
Instrument	Condition
Video signal generator [TG-7/2(Shibasoku), Model 1411 (Tektronix), Model 430 P (Leader), or equivalent]	Previously calibrated instrument.
Oscilloscope	Calibrated instrument with a 100 MHz or higher band measurement capability.
Color monitor TV	Instrument with a 75 Ω (video input.)
Multimeter	Calibrated instrument with a 10 M Ω or higher input impedance.

3.2.2 Tools to be Prepared

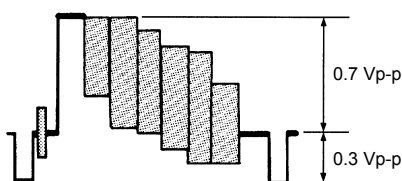


3.2.3 Signals Required for Adjustments

- (1) Y/C color bars signal

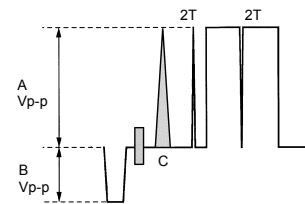


- (2) Composite color-bar signal (100% white, 75% chroma)

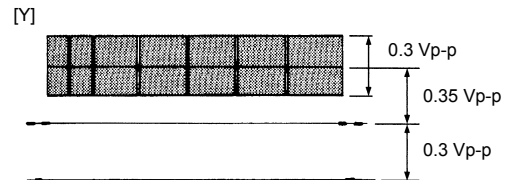


- (3) Composite pulse & bar signal

A = 0.7, B = 0.3, C = 20T



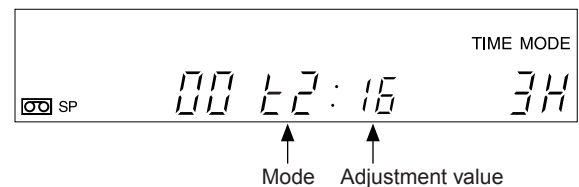
- (4) Y/C video sweep signal (B/W)



3.3 SERVICE MODES USED IN ADJUSTMENTS

3.3.1 SERVO ADJUST MODE Setting Method

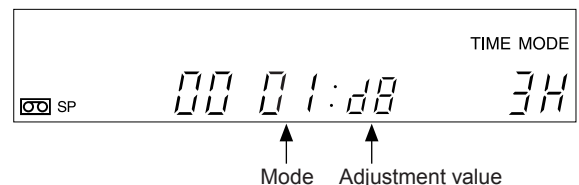
- (1) Press the [STOP], [PAUSE] and [MENU] buttons simultaneously
- (2) Press the [SHIFT▼] or [SHIFT▶] button to select "SERVO ADJUST", then press the [SET -] or [SET +] button.
- (3) The front panel FDP shows the following information.



- (4) Press the [SHIFT▼] or [SHIFT▶] button to switch the mode.
- (5) Press the [V.LOCK -] or [V.LOCK +] button to vary the adjustment value.
- (6) Press the [MENU] button to cancel the SERVICE MENU.

3.3.2 EVR ADJUST MODE Setting Method

- (1) Press the [STOP], [PAUSE] and [MENU] buttons simultaneously
- (2) Press the [SHIFT▼] or [SHIFT▶] button to select "EVR ADJUST", then press the [SET -] or [SET +] button.
- (3) The front panel FDP shows the following information.

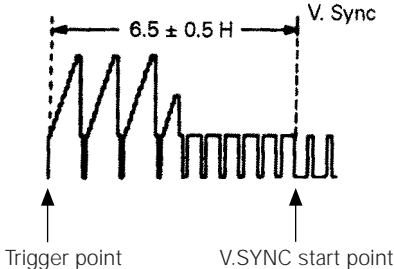


- (4) Press the [SHIFT▼] or [SHIFT▶] button to switch the mode.
- (5) Press the [V.LOCK -] or [V.LOCK +] button to vary the adjustment value.
- (6) Press the [MENU] button to cancel the SERVICE MENU.
- (7) When the [RESET/CANCEL], [SET -] and [SET +] buttons are pressed simultaneously in step (3), all of the adjustment values in the EVR ADJUST MODE will be reset.

3.4 SERVO ADJUSTMENTS

CAUTION

- ① If the video adjustments are not completed before proceeding to the servo adjustments, reset the EVR ADJUST MODE adjustment values as described in section 3.3.2 (7).
- ② Before performing the servo adjustments, recording should be done in 48H mode for two minutes. (The TL tape feed amount is automatically adjusted.)

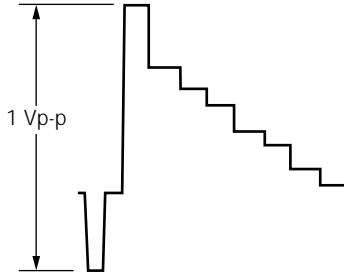
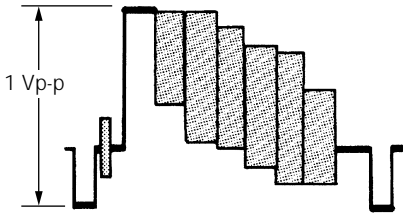
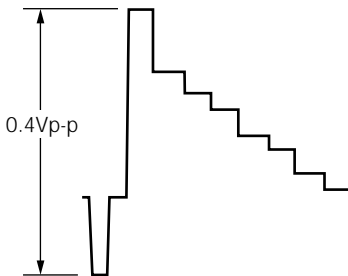
No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (①) Adjustment level (☆)	Adjustment procedure								
1	SW point adjustment	Oscilloscope (Trigger: D-FF), Alignment tape, VFK1741 	SERVO ADJUST t6 3H PB	◎ VIDEO OUT terminal, 75Ω terminated ① [V.LOCK-/+] buttons ☆ 6.5 H ± 0.5H	(1) Set SERVO ADJUST mode "t6" as described in the SERVO ADJUST MODE setting method. (2) Set the oscilloscope as shown below. <table border="1"><tr><th colspan="2">Oscilloscope setting</th></tr><tr><td>TRIG</td><td>TP4 [P/R]:7F</td></tr><tr><td>SLOPE</td><td>⊖</td></tr><tr><td>SWEEP TIME/DIV range</td><td>50 μs/DIV</td></tr></table> (3) Play the alignment tape, check FM wave form (TP5[P/R]: 8F) and optimize tracking. (4) Adjust the [V.LOCK-] or [V.LOCK +] button so that the duration from the trigger point to V.SYNC start point is 6.5H.	Oscilloscope setting		TRIG	TP4 [P/R]:7F	SLOPE	⊖	SWEEP TIME/DIV range	50 μs/DIV
Oscilloscope setting													
TRIG	TP4 [P/R]:7F												
SLOPE	⊖												
SWEEP TIME/DIV range	50 μs/DIV												
2	V-LOCK adjustment	Monitor TV, Color bar signal	SERVO ADJUST t3 3H REC ↓ 3H PB (PAUSE) L12H REC ↓ L12H PB L24H REC ↓ L24H PB	◎ VIDEO OUT terminal, 75Ω terminated ① [V.LOCK-/+] buttons ☆ Minimize vertical dancing of image	(1) Insert a S-VHS cassette tape. (2) Apply the color bar signal input. (3) Set SERVO ADJUST mode "t3" as described in the SERVO ADJUST MODE setting method. (4) Set to 3H mode with the [SET+] or [SET-] button, and perform recording and playback. (5) Press the [PAUSE] button and adjust the [V.LOCK -] or [V.LOCK +] button to minimize the vertical dancing. (6) Perform recording and playback in L12H mode. (7) Adjust the [V.LOCK-] or [V.LOCK +] button to minimize the vertical dancing. (8) Perform recording and playback in L24H mode. (9) Adjust the [V.LOCK-] or [V.LOCK +] button to minimize the vertical dancing.								
3	Slow tracking preset adjustment	Monitor TV, Color bar signal	SERVO ADJUST t2 3H REC ↓ 24H PB	◎ VIDEO OUT terminal, 75Ω terminated ① [V.LOCK-/+] buttons ☆ Minimize noise.	<div>CAUTION Do not use the tape section near the beginning or end.</div> (1) Apply the color bar signal input. (2) Set SERVO ADJUST mode "t2" as described in the SERVO ADJUST MODE setting method. (3) Perform recording in 3H mode and playback in 24H mode. (4) Adjust the [V.LOCK -] or [V.LOCK +] button to minimize noise at the top and bottom of the monitor screen.								

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (①) Adjustment level (☆)	Adjustment procedure
4	Skew adjustment	Monitor TV, Color bar signal		◎ VIDEO OUT terminal, 75Ω terminated ① [V.LOCK-/+] buttons ☆ Minimize vertical fluctuation of image	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> CAUTION Image skew during playback is greatly dependent on the AFC characteristics of the monitor TV. Use a tape section near the beginning. </div> <div> (1) Insert a S-VHS cassette tape. (2) Apply the color bar signal input. (3) Set to 48H mode with the [SET +] or [SET -] button, and perform recording. (4) Perform playback in 3H mode. (5) Check that the image at the top is not skewed. If it is skewed, go to steps (6) to (10). </div>
		<div style="border: 1px solid black; padding: 5px; text-align: center;"> [SERVO ADJUST MODE] 24H SLOW TRACKING (1B) 3HVLK (12) L12HVLK (FE) L24HVLK (FC) 48H TL MOVE (27) 48H SKW (1D) L12H SKW (70) L24H SKW (4C) \$W. POINT (33) </div> <p style="text-align: center;">OK</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> [SERVO ADJUST MODE] 24H SLOW TRACKING (1B) 3HVLK (12) L12HVLK (FE) L24HVLK (FC) 48H TL MOVE (27) 48H SKW (1D) L12H SKW (70) L24H SKW (4C) \$W. POINT (33) </div> <p style="text-align: center;">NG</p>	48H REC ↓ 3H PB SERVO ADJUST t5 48H REC ↓ 3H PB ↓ 48H REC	Checking Adjusting V. LOCK + : right deviation V. LOCK - : left deviation	(6) Set SERVO ADJUST mode "t5" as described in the SERVO ADJUST MODE setting method. (7) Record the color bar signal in 48H mode. (8) Every 10 seconds during recording, adjust the [V.LOCK-] or [V.LOCK +] button to vary "48H SKW (**)" at around 1D. (9) Play the recording in 3H mode and check "(**)" at which the image skew is minimum. (10) Perform recording in 48H mode and set the value to the data checked in step (9).
			L24H REC ↓ 3H PB	Checking	(11) Record the color bar signal in L24H mode. (12) Play the recording in 3H mode. (13) Check that top of image is not skewed. If it is skewed, go to steps (14) to (17).
			L24H REC ↓ 3H PB ↓ L24H REC	Adjusting	(14) Record the color bar signal in L24H mode. (15) Every 10 seconds during recording, adjust the [V.LOCK -] or [V.LOCK +] button to vary "L24H SKW (**)" at around 4C. (16) Play the recording in 3H mode and check "(**)" at which the image skew is minimum. (17) Perform recording in L24H mode and set the value to the data checked in step (16).
			L12H REC ↓ 3H PB	Checking	(18) Record the color bar signal in L12H mode. (19) Play the recording in 3H mode. (20) Check that top of image is not skewed. If it is skewed, go to steps (21) to (24).
			L12H REC ↓ 3H PB ↓ L12H REC	Adjusting	(21) Record the color bar signal in L12H mode. (22) Every 10 seconds during recording, adjust the [V.LOCK-] or [V.LOCK +] button to vary "L12H SKW (**)" at around 70. (23) Play the recording in 3H mode and check "(**)" at which the image skew is minimum. (24) Perform recording in L12H mode and set the value to the data checked in step (23).

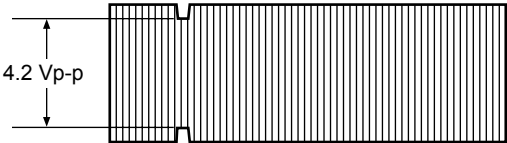
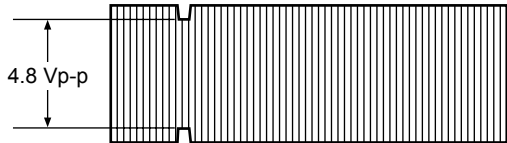
3.5 VIDEO ADJUSTMENTS

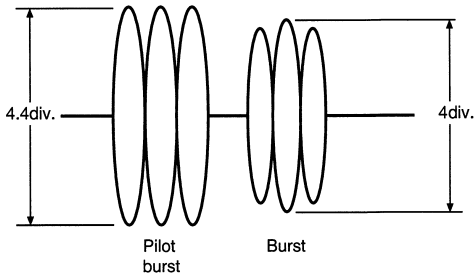
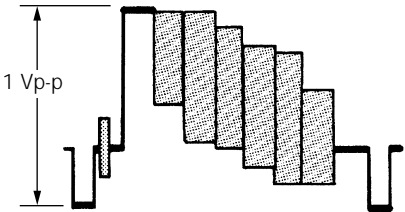
CAUTION

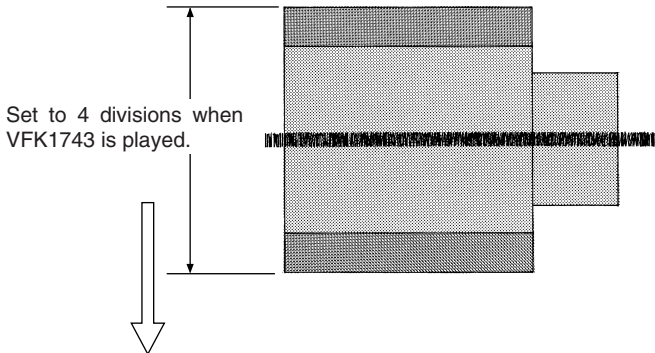
After replacing the IC607 on the MAIN board (EEPROM), reset the EVR ADJUST MODE adjustment values as described in section 3.3.2 (7), then proceed to the following video adjustments.

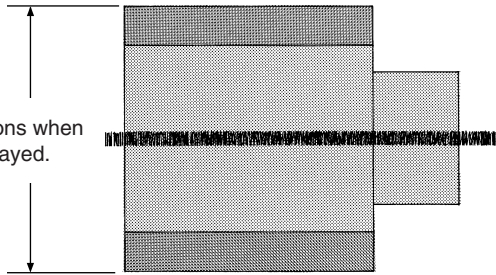
No.	Item	Measuring instruments & Input signals	Mode	Measuring point (◎) Adjustment parts (①) Adjustment level (☆)	Adjustment procedure
1	AGC level adjustment	Oscilloscope (H rate), Color bar signal (Y/C) ↓ Y/C IN 	EE, EVR ADJUST 11	◎ Y/C Y OUT terminal, 75Ω terminated ① [V.LOCK-/+] buttons ☆ 1 Vp-p	(1) Press the [MENU] button, select the "VIDEO/ VTR MODE" of the main menu , and change the VIDEO INPUT to "YC". (2) Apply the color bar signal input. (3) Set EVR ADJUST mode "11" as described in the EVR ADJUST MODE setting method. (4) Adjust the [V.LOCK -] or [V.LOCK +] button to set the Y level at the measurement point to the adjustment level.
2	EE VIDEO level adjustment	Oscilloscope (H rate), Color bar signal ↓ VIDEO IN 	EE	◎ VIDEO OUT terminal, 75Ω terminated ① VR2 [MAIN]:16F ☆ 1 Vp-p	(1) Press the [MENU] button, select the "VIDEO/ VTR MODE" of the main menu , and change the VIDEO INPUT to "LINE". (2) Apply the color bar signal input. (3) Adjust the VR2 to set the video level at the measurement point to the adjustment level.
3	Sub-emphasis input level adjustment	Oscilloscope (H rate), Color bar signal ↓ VIDEO IN 	EE EVR ADJUST 15	◎ TP2 [MAIN]:10Q ① [V.LOCK-/+] buttons ☆ 0.4 Vp-p GND TP7 [MAIN]:15Q	(1) Apply the color bar signal input. (2) Set EVR ADJUST mode "15" as described in the EVR ADJUST MODE setting method. (3) Adjust the [V.LOCK -] or [V.LOCK +] button to set the Y level at the measurement point to the adjustment level.

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (*) Adjustment parts (-) Adjustment level (+)	Adjustment procedure
4	White & dark clip adjustment [S-VHS ET]	Oscilloscope (H rate), Pulse & bar signal ↓ VIDEO IN	EE, EVR ADJUST 14	* TP3 [MAIN] : 10Q - [V.LOCK -/+] buttons + White clip: 190% Dark clip: 70±10% GND TP7 [MAIN]: 15Q	(1) Insert a VHS cassette tape. (2) Apply the pulse & bar signal input. (3) Set EVR ADJUST mode "14" as described in the EVR ADJUST MODE setting method. (4) Adjust the oscilloscope gain so that the section between the sync tip and 100% white extends over 4.0 divisions. (5) Adjust the [V.LOCK -] or [V.LOCK +] button to set the white level at the measurement point to 190% (3.6 divisions). (6) Eject a VHS cassette tape.
	White & dark clip adjustment [S-VHS]			* TP3 [MAIN] : 10Q - [V.LOCK -/+] buttons + White clip: 210% Dark clip: 70±10% GND TP7 [MAIN]: 15Q	(7) Apply the pulse & bar signal input. (8) Set EVR ADJUST mode "14" as described in the EVR ADJUST MODE setting method. (9) Adjust the oscilloscope gain so that the section between the sync tip and 100% white extends over 4.0 divisions. (10) Adjust the [V.LOCK -] or [V.LOCK +] button to set the white level at the measurement point to 210% (4.4 divisions).
5	Carrier & deviation adjustments	Frequency Counter No signal input	3H REC	* TP1 [P/R]: 4F GND TP3 [P/R]: 5F	(1) Apply the color bar signal input. (2) Turn OFF the power of the unit. (3) Connect the jumper wire between TP2 and TP7 (GND) on the MAIN board. (4) Connect the frequency counter to TP1 on the R/P board. (5) Turn ON the power of the unit.

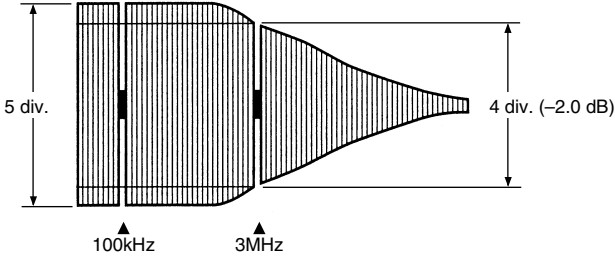
No.	Item	Measuring instruments & Input signals	Mode	Measuring point (*) Adjustment parts (-) Adjustment level (+)	Adjustment procedure
			EVR ADJUST 12 (Carrier)	* [V.LOCK-/+] buttons + Carrier: 5.4 MHz	(6) Insert a S-VHS cassette tape. (7) Set EVR ADJUST mode "12" as described in the EVR ADJUST MODE setting method. (8) Set the 3H mode by pressing the [SET-] or [SET +] button. (9) Press the [REC] button. (10) Adjust the [V.LOCK-] or [V.LOCK +] button to set carrier frequency to 5.4MHz. (as close a point)
6	S-VHS ET SP REC FM level adjustment	Oscilloscope (Trigger:D-FF TP4 [P/R]: 7F _d Slope), Color bar signal ↓ VIDEO IN 	3H REC EVR ADJUST 01	* TP1 [P/R]: 4F - [V.LOCK-/+] buttons + 4.2 Vp-p GND TP3 [P/R]: 5F	(1) Insert a VHS cassette tape. (2) Apply the color bar signal input. (3) Set EVR ADJUST mode "01" as described in the EVR ADJUST MODE setting method. (4) Set the 3H mode by pressing the [SET -] or [SET +] button. (5) Press the [REC] button. (6) Adjust the [V.LOCK-] or [V.LOCK +] button to set the FM level at the adjustment point to the adjustment level.
7	S-VHS SP REC FM level adjustment	Oscilloscope (Trigger:D-FF TP4 [P/R]: 7F _d Slope), Color bar signal ↓ VIDEO IN 	3H REC EVR ADJUST 01	* TP1 [P/R]: 4F - [V.LOCK-/+] buttons + 4.8 Vp-p GND TP3 [P/R]: 5F	(1) Insert a S-VHS cassette tape. (2) Apply the color bar signal input. (3) Set EVR ADJUST mode "01" as described in the EVR ADJUST MODE setting method. (4) Set the 3H mode by pressing the [SET -] or [SET +] button. (5) Press the [REC] button. (6) Adjust the [V.LOCK-] or [V.LOCK +] button to set the FM level at the adjustment point to the adjustment level.

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (⊙) Adjustment parts (⌚) Adjustment level (☆)	Adjustment procedure
8	Pilot burst level adjustment	Oscilloscope (Trigger:VIDEO OUT, H rate), Color bar signal ↓ VIDEO IN 	EE EVR ADJUST 16	⊙ TP5 [MAIN] ⌚ [V.LOCK -/+] buttons ☆ Burst level × 1.1	(1) Apply the color bar signal input. (2) Set EVR ADJUST mode "16" as described in the EVR ADJUST MODE setting method. (3) Adjust the oscilloscope gain so that the burst signal level becomes 4 divisions. (4) Adjust the [V.LOCK -] or [V.LOCK +] button to set the pilot burst level at the measurement point to 4.4 divisions.
9	S-VHS PB Y level adjustment	Oscilloscope (H rate), Color bar signal ↓ VIDEO IN 	3H REC ↓ 3H PB EVR ADJUST 10	⊙ VIDEO OUT terminal, 75Ω terminated ⌚ [V.LOCK -/+] buttons ☆ 1 Vp-p	(1) Insert a S-VHS cassette tape. (2) Apply the color bar signal input. (3) Set EVR ADJUST mode "10" as described in the EVR ADJUST MODE setting method. (4) Record the color bar signal and play it back. (5) Adjust the [V.LOCK -] or [V.LOCK +] button to set the Y level (100% white) at the adjustment point to the adjustment level.
10	LC VCO level adjustment	Digital voltmeter, Color bar signal ↓ VIDEO IN	EE	⊙ TP4 [MAIN]: 12Q ⌚ FL3 [MAIN]: 11I ☆ $2.5 \pm 0.1V_{DC}$ GND TP7 [MAIN]: 15Q	(1) Tilt the MAIN board as discribed in section 1.1.7 (1), (2) and (3). (2) Apply the color bar signal input. (3) Adjust the FL3 to set the DC level to the adjustment level.

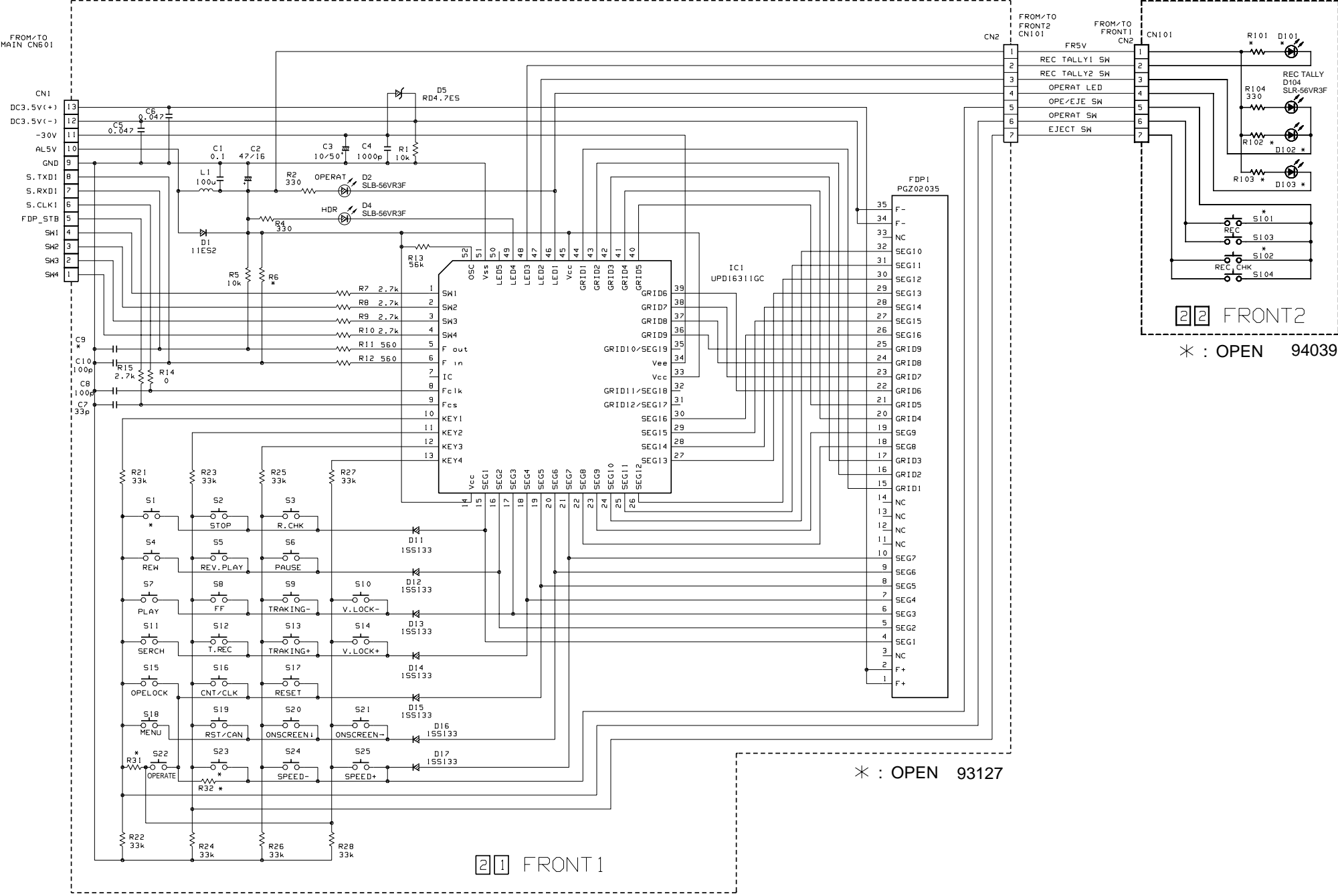
No.	Item	Measuring instruments & Input signals	Mode	Measuring point (⊙) Adjustment parts (Ⓜ) Adjustment level (☆)	Adjustment procedure
11	S-VHS ET SP REC color level adjustment	Oscilloscope (Trigger:D-FF TP4[P/R]:7F), Color bar signal, Alignment tape VFK1743	SP mode 3H PB 3H REC ↓ 3H PB EVR ADJUST 02	⊙ TP6 [P/R]: 8F Ⓜ [V.LOCK -/+] buttons ☆ +1.0 dB GND TP3 [P/R]: 5F V.LOCK +: Level UP V.LOCK -: Level DOWN	<p>(1) Apply the color bar signal input. (2) Play the alignment tape and adjust tracking to maximize the color level. (3) Adjust the oscilloscope gain so that the channel with the higher level becomes 4 divisions. (4) Insert a VHS cassette tape, record and play the color bar signal. (5) Ensure that the color level of the channel with the higher level is +1.0 dB of the level in step (3) (i.e. occupying 4.5 divisions). (6) If adjustment is required, set EVR ADJUST mode "02", adjust the [V.LOCK -] or [V.LOCK +] button to set the color level before recording, and perform checking in steps (4) and (5) again.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>CAUTION After the SP mode adjustments, be sure to perform SP TL mode adjustments in steps (7) to (12).</p> </div> <p>(7) Play the alignment tape in 3H mode and adjust tracking to maximize the color level. (8) Adjust the oscilloscope gain so that the channel with the higher level becomes 4 divisions. (9) Insert a VHS cassette tape. (10) Record the color bar signal in 24H mode and play the recording in 3H mode. (11) Ensure that the color level of the channel with the higher level is between +1.0 and 0 dB of the level in step (8) (i.e. occupying 4.5 to 4 divisions). (12) If adjustment is required, set EVR ADJUST mode "02", adjust the [V.LOCK -] or [V.LOCK +] button to set the color level before recording, and perform checking in steps (9) to (11) again.</p>
					
			SP TL mode 3H PB 24H REC ↓ 3H PB	☆ +1.0 to 0 dB	

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (⊙) Adjustment parts (⬆) Adjustment level (☆)	Adjustment procedure
12	S-VHS SP REC color level adjust- ment	Oscilloscope (Trigger:D-FF TP4[P/R]:7F), Color bar signal, Alignment tape VFK1743	SP mode 3H PB 3H REC ↓ 3H PB EVR ADJUST 02	⊙ TP6 [P/R]: 8F ⬆ [V.LOCK -/+] buttons ☆ +2.0 dB GND TP3 [P/R]: 5F V.LOCK +: Level UP V.LOCK -: Level DOWN	(1) Apply the color bar signal input. (2) Play the alignment tape and adjust tracking to maximize the color level. (3) Adjust the oscilloscope gain so that the channel with the higher level becomes 4 divisions. (4) Insert a S-VHS cassette tape, record and play the color bar signal. (5) Ensure that the color level of the channel with the higher level is +2.0 dB of the level in step (3) (i.e. occupying 5 divisions). (6) If adjustment is required, set EVR ADJUST mode "02", adjust the [V.LOCK -] or [V.LOCK +] button to set the color level before recording, and perform checking in steps (4) and (5) again.
<div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center; margin-right: 20px;"> <p>Set to 4 divisions when VFK1743 is played.</p>  <p>Check that this is 5 divisions when material recorded with the same unit is played.</p> </div> <div style="border: 1px solid black; padding: 10px; width: 300px;"> <p>CAUTION After the SP mode adjustments, be sure to perform SP TL mode adjustments in steps (7) to (12).</p> </div> </div>					
			SP TL mode 3H PB 24H REC ↓ 3H PB	☆ +1.0 to 2.0dB	(7) Play the alignment tape in 3H mode and adjust tracking to maximize the color level. (8) Adjust the oscilloscope gain so that the channel with the higher level becomes 4 divisions. (9) Insert a S-VHS cassette tape. (10) Record the color bar signal in 24H mode and play the recording in 3H mode. (11) Ensure that the color level of the channel with the higher level is between +1.0 and 2.0 dB of the level in step (8) (i.e. occupying 4.5 to 5 divisions). (12) If adjustment is required, set EVR ADJUST mode "02", adjust the [V.LOCK -] or [V.LOCK +] button to set the color level before recording, and perform checking in steps (9) to (11) again.

No.	Item	Measuring instruments & Input signals	Mode	Measuring point (⊙) Adjustment parts (⌚) Adjustment level (☆)	Adjustment procedure
13	Frequency response adjustment	Oscilloscope (Trigger:D-FF TP4[P/R]:7F), Y/C video sweep signal ↓ Y/C IN	3H REC ↓ 3H PB	⊙ Y/C Y OUT terminal, 75Ω terminated ⌚ VR4 [MAIN]: 15M ☆ 4 div. (3 MHz)	(1) Press the [MENU] button, select the "VIDEO/ VTR MODE" of the main menu, and change the VIDEO INPUT to "YC". (2) Insert a S-VHS cassette tape. (3) Record the Y/C video sweep signal and play it back. (4) Adjust the oscilloscope gain so that the 100kHz level becomes 5 divisions. (5) Adjust the VR4 to set the 3 MHz level at the measurement point to the adjustment level.



4.9 FRONT1,2 BOARD SCHEMATIC DIAGRAM




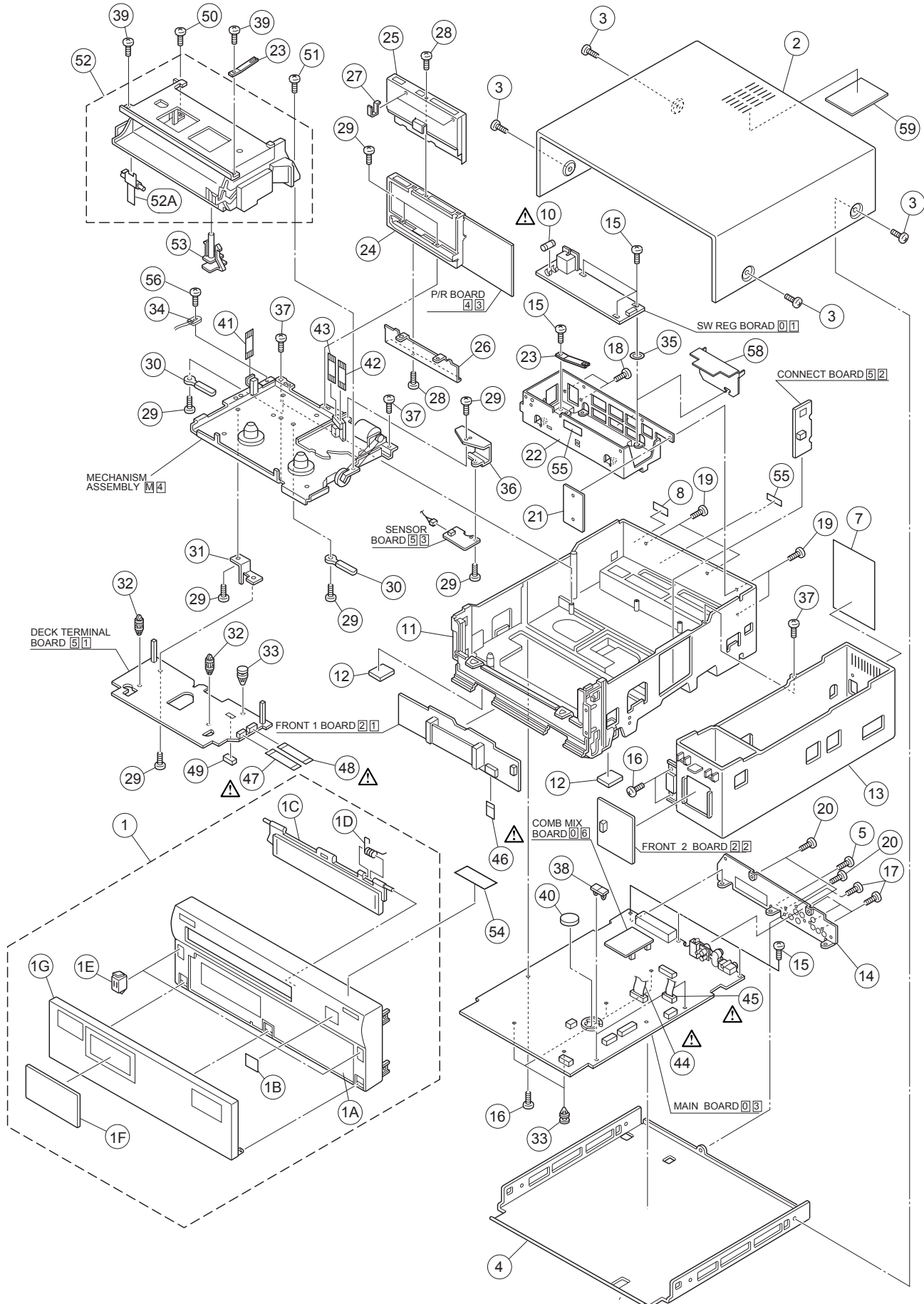
SERVICING FIXTURES & TOOLS


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5.1 CABINET & CHASSIS ASSEMBLY

M 2

Components identified with the mark  have the special characteristics for safety. When replacing any of these components, use only the same type.




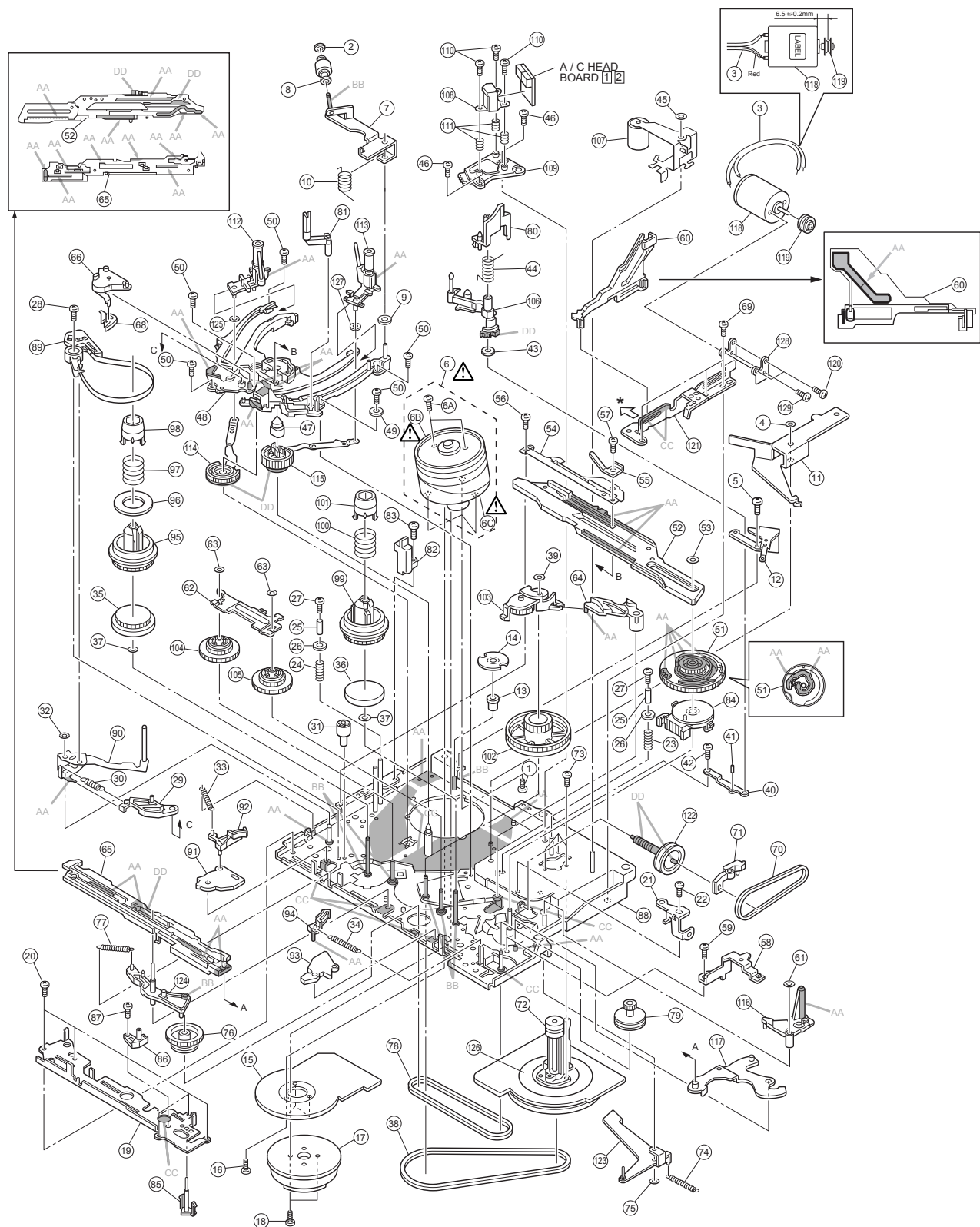
Components identified with the mark  have the special characteristics for safety. When replacing any of these components, use only the same type.

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5.2 MECHANISM ASSEMBLY

M 4

Components identified with the mark  have the special characteristics for safety. When replacing any of these components, use only the same type.



NOTE : The section marked in AA, BB, CC and DD indicate lubrication and greasing areas.
* When installing the No. 121 guide bracket, draw up to the direction by the arrow.


Category	Part No.	MARK
Greases	VFK1748	AA
	VFK1750	DD
	VFK1749	CC
Oil	VFK1751	BB

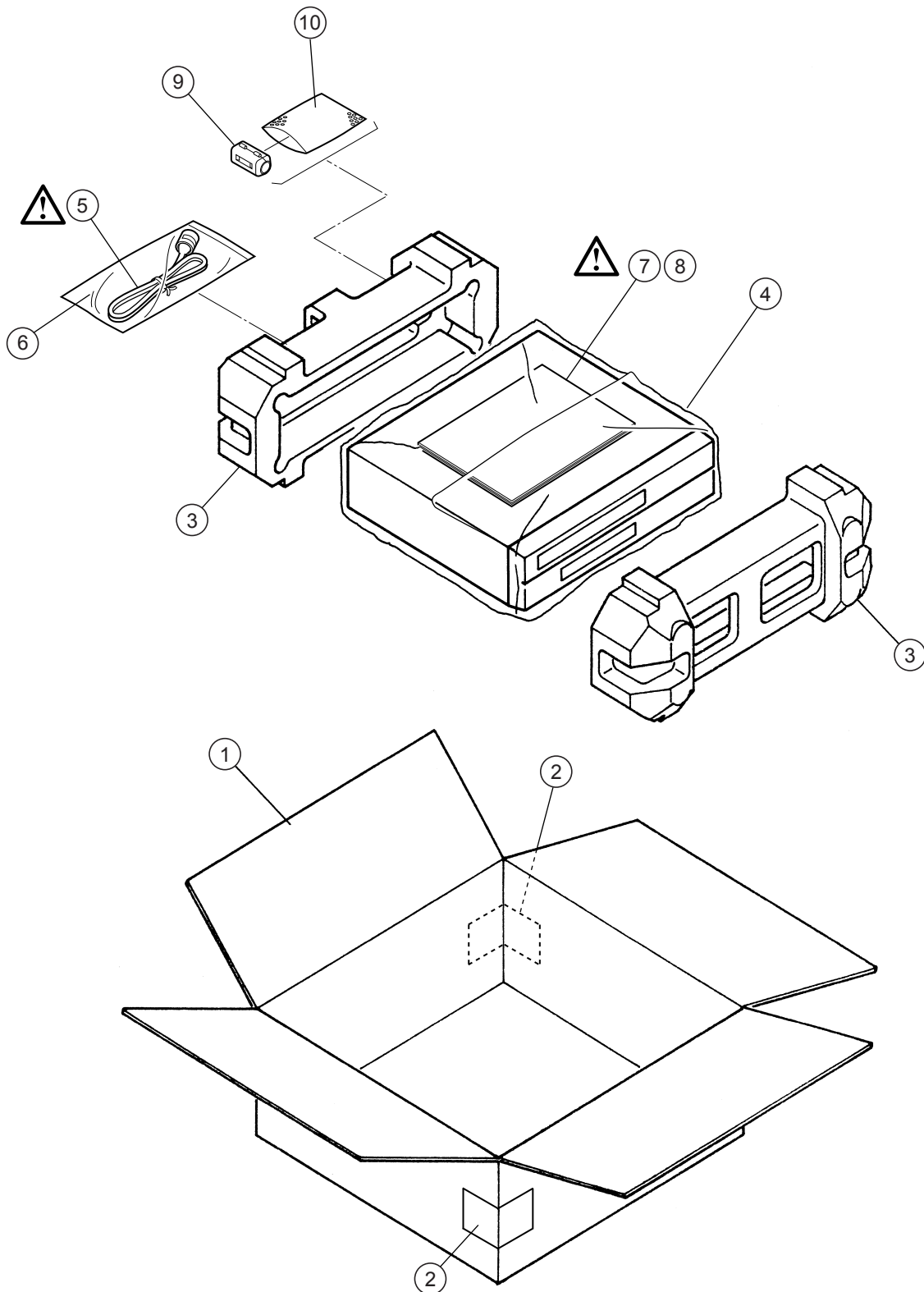
When replacing any of these components, use only the same type


Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
1	QYSPSP2606Z	SCREW	1	M2.6X6
2	PQM30017-25	SLIT WASHER	1	
3	3010180AJ632	WIRE	1	
4	PQM30017-31	SLIT WASHER	1	
5	QYSDST2606Z	SCREW	1	M2.6X6
△ 6	PDR2024B	DRUM ASS'Y	1	
6A	PDM4165A	SCREW	1	
△ 6B	PRD20614F	UPPER DRUM ASS'Y	1	
△ 6C	PRD20619B	LOWER DRUM ASS'Y	1	
7	PRD45283A	H.C.ARM ASS'Y	1	
8	PQ46417A-2	ROLLER ASS'Y	1	
9	QYWFM315425	WASHER	1	
10	PRD45079	TORSION SPRING	1	
11	PRD31301	RELEASE ARM	1	
12	PRD45297A	BRUSH ASS'Y	1	
13	PRD45276A	ROLLER ASS'Y	1	
14	PRD45275	INERTIA PLATE	1	
15	PGZ02610	STATOR ASS'Y	1	
16	QYSPSPU17C02	SCREW	1	M1.7X12
17	PDZ0097-2	ROTOR ASS'Y	1	
18	QYSPSP2608N	SCREW	1	M2.6X8
19	PRD20625	MAIN PLATE	1	
20	QYSPST2606Z	SCREW	5	M2.6X6
21	PRD45055	W. GEAR BRACKET	1	
22	QYSDSP2606Z	SCREW	1	M2.6X6
23	PRD30023-62	COMP. SPRING 62	1	
24	PRD30023-63	COMP. SPRING 63	1	
25	PRD45080	TAPE GUIDE	2	
26	PRD45081	GUIDE FLANGE	2	
27	PRD43165	SCREW	2	M2X6
28	QYSDSP2606Z	SCREW	1	M2.6X6
29	PQ35012-1-5	T. ARM LEVER	1	
30	PRD30024-108	TEN. SPRING 109	1	
31	PQ46302-1-3	ADJUST PIN	1	
32	PQM30017-47	SLIT WASHER	1	
33	PQM30001-393	TEN. SPRING 393	1	
34	30001-389102	TEN. SPRING 102	1	
35	PQ35436	SLIT DISK (S)	1	
36	PQ35437	SLIT DISK (T)	1	
37	PQM30018-69	SPACER	2	
38	PQM30003-38	BELT (CAPSTAN)	1	
39	QYWFM214025	WASHER	1	
40	PRD45056	HEIGHT PLATE	1	
41	QYYASPF2005F	SCREW	1	M2X5
42	QYSPST2606Z	SCREW	1	M2.6X6
43	QYWFM315425	WASHER	1	
44	PQ46326-2	TOR. SPRING 2	1	
45	PQM30017-24	SLIT WASHER	1	
46	QYSDSP2606Z	SCREW	2	M2.6X6
47	PQ46767-1-2	GUIDE CAP	1	
48	PQ11657-1-9	GUIDE RAIL	1	
49	LP40005-001A	SPACER	1	
50	QYSPST2608Z	SCREW	5	M2.6X8
51	PQ21684-1-3	CONTROL CAM	1	
52	PQ11658-1-15	CONTROL PLATE	1	
53	PQM30017-8	SLIT WASHER	1	
54	PQ35138-2	CONTROL BRACKET	1	
55	PQ46423	EARTH PLATE	1	
56	QYSPST2606Z	SCREW	1	M2.6X6
57	QYSPSF2608M	SCREW	1	M2.6X8
58	PQ35217-1-2	CTL BRACKET 2	1	
59	QYSPST2606Z	SCREW	1	M2.6X6
60	PQ21685-2-10	PINCH R. PLATE	1	
61	PQM30017-8	SLIT WASHER	1	
62	PQ35083-2	REEL BRACKET	1	
63	PQM30017-51	SLIT WASHER	2	
64	PQ35026-1-7	IDLER LEVER	1	
65	PQ11659-2	SLIDE PLATE	1	
66	PQ21686-1-3	T-UP LEVER	1	
68	PQ46345-1-2	T-UP HEAD	1	
69	QYSPST2606Z	SCREW	1	M2.6X6
70	PQM30003-39	BELT (LOADING)	1	
71	PQ21699-1-2	WORM BEARING	1	
72	PGS30512A-01	CAPSTAN MOTOR ASS'Y	1	

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5.3 PACKING ASSEMBLY

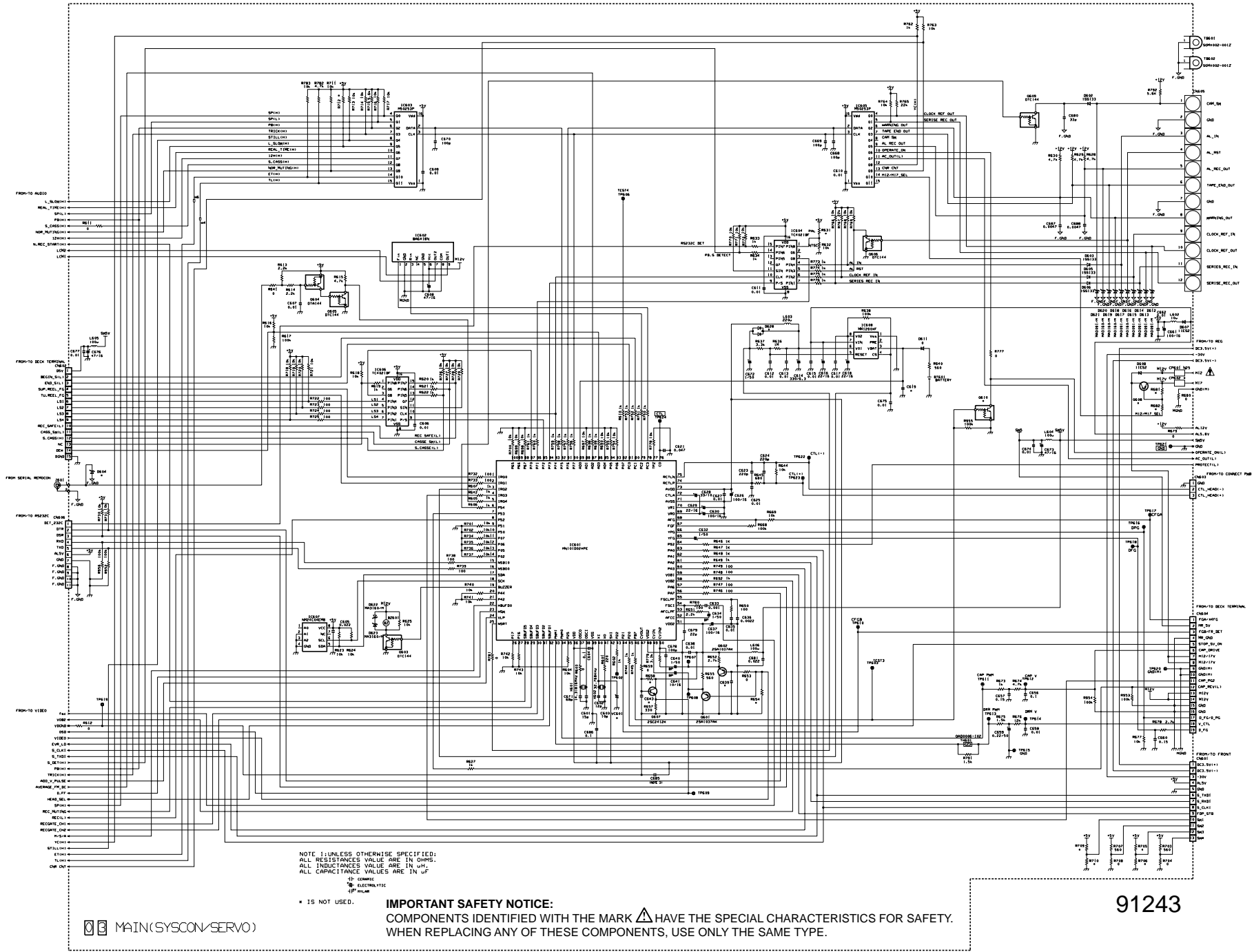
Components identified with the mark  have the special characteristics for safety. When replacing any of these components, use only the same type.



Components identified with the mark  have the special characteristics for safety. When replacing any of these components, use only the same type.

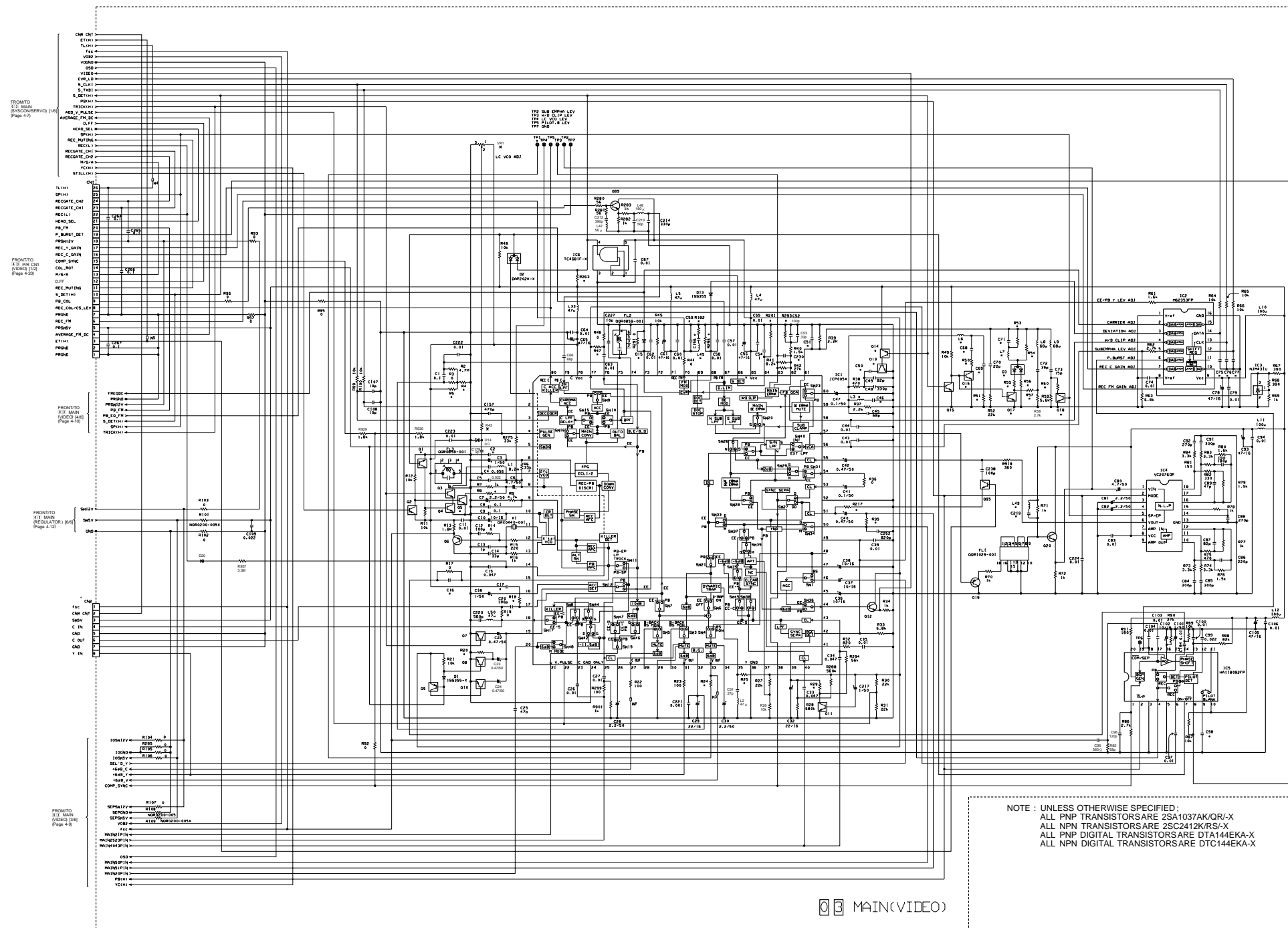
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4.5 MAIN BOARD SCHEMATIC DIAGRAMS [1/6]
4.5.1 SYSCON/SERVO



4.5 MAIN BOARD SCHEMATIC DIAGRAMS [2/6]

4.5.2 VIDEO (1/3)



MAIN(VIDEO)

4.5.3 VIDEO (2/3)

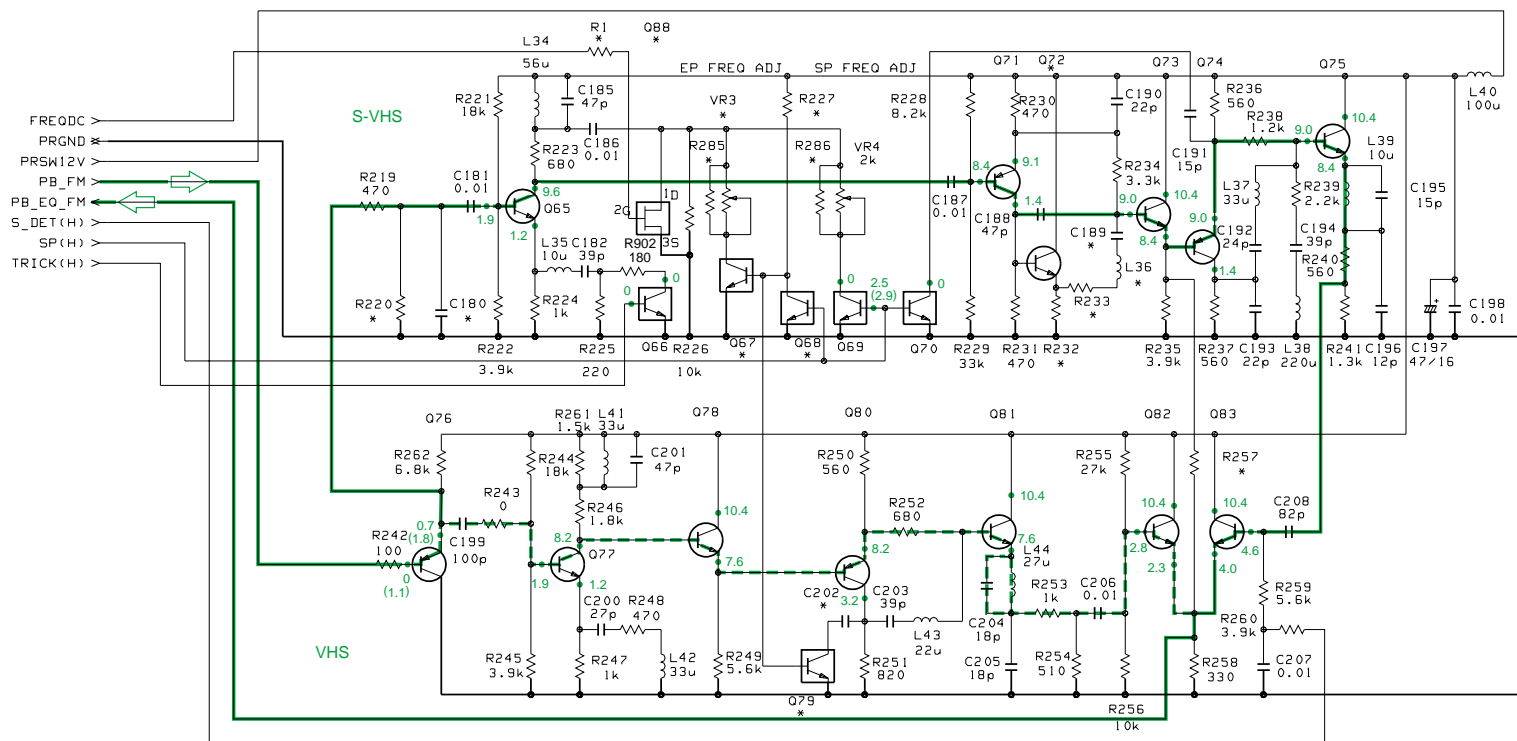


NOTE : UNLESS OTHERWISE SPECIFIED;
ALL PNP TRANSISTORS ARE 2SA1037AK/QR/-X
ALL NPN TRANSISTORS ARE 2SC2412K/RS/-X
ALL PNP DIGITAL TRANSISTORS ARE DTA144EKA-X
ALL NPN DIGITAL TRANSISTORS ARE DTC144EKA-X

4.5 MAIN BOARD SCHEMATIC DIAGRAMS [4/6]

4.5.4 VIDEO (3/3)

FROM/TO
⑥/③ MAIN
(VIDEO) [2/6]
(Page 4-8)

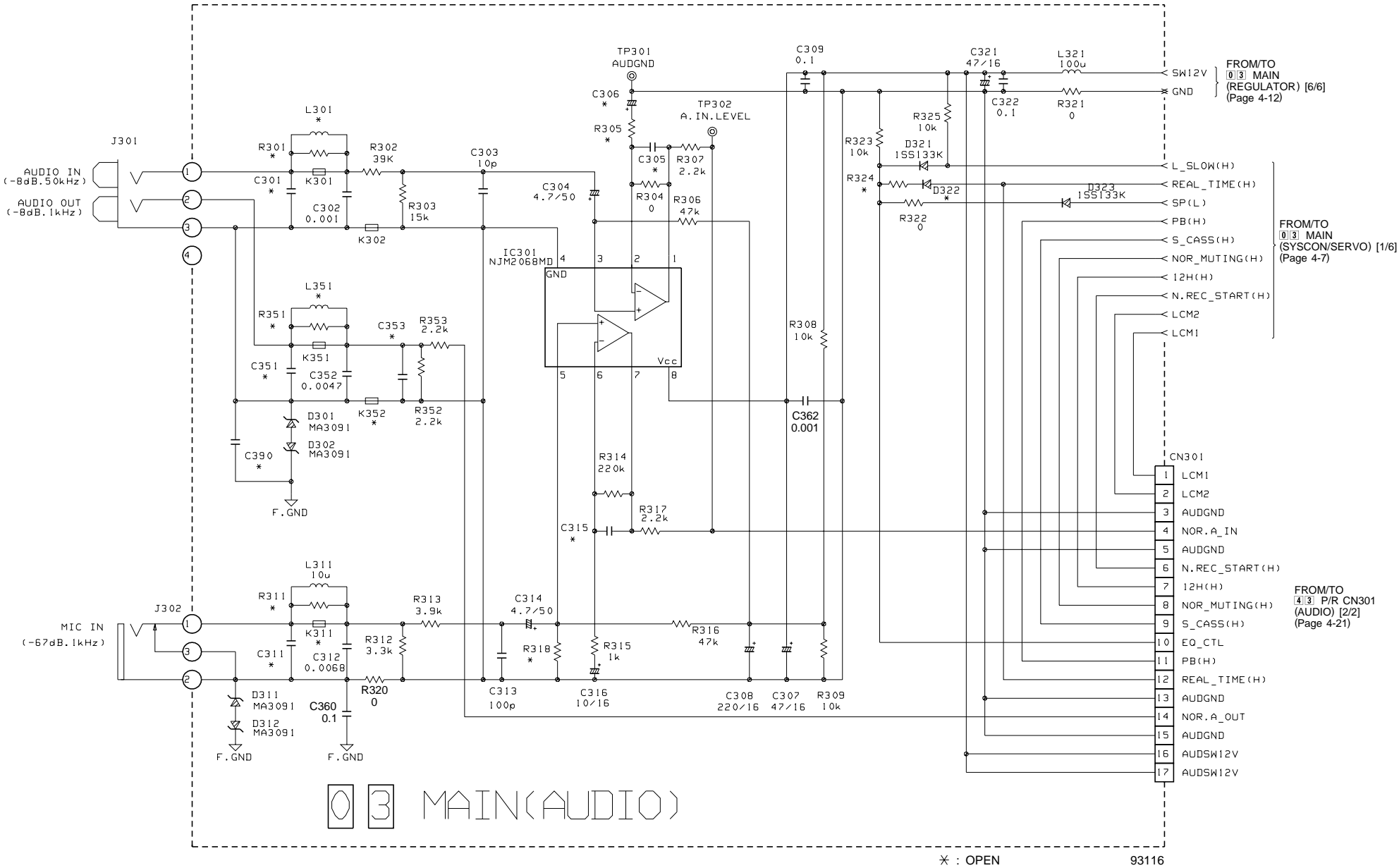


⑥ ③ MAIN(VIDEO)

NOTE : UNLESS OTHERWISE SPECIFIED;
ALL PNP TRANSISTORS ARE 2SA1037AK/QR/-X
ALL NPN TRANSISTORS ARE 2SC2412K/RS/-X
ALL PNP DIGITAL TRANSISTORS ARE DTA144EKA-X
ALL NPN DIGITAL TRANSISTORS ARE DTC144EKA-X

※ : OPEN 91204 (3/3)

4.5 MAIN BOARD SCHEMATIC DIAGRAMS [5/6]
4.5.5 AUDIO

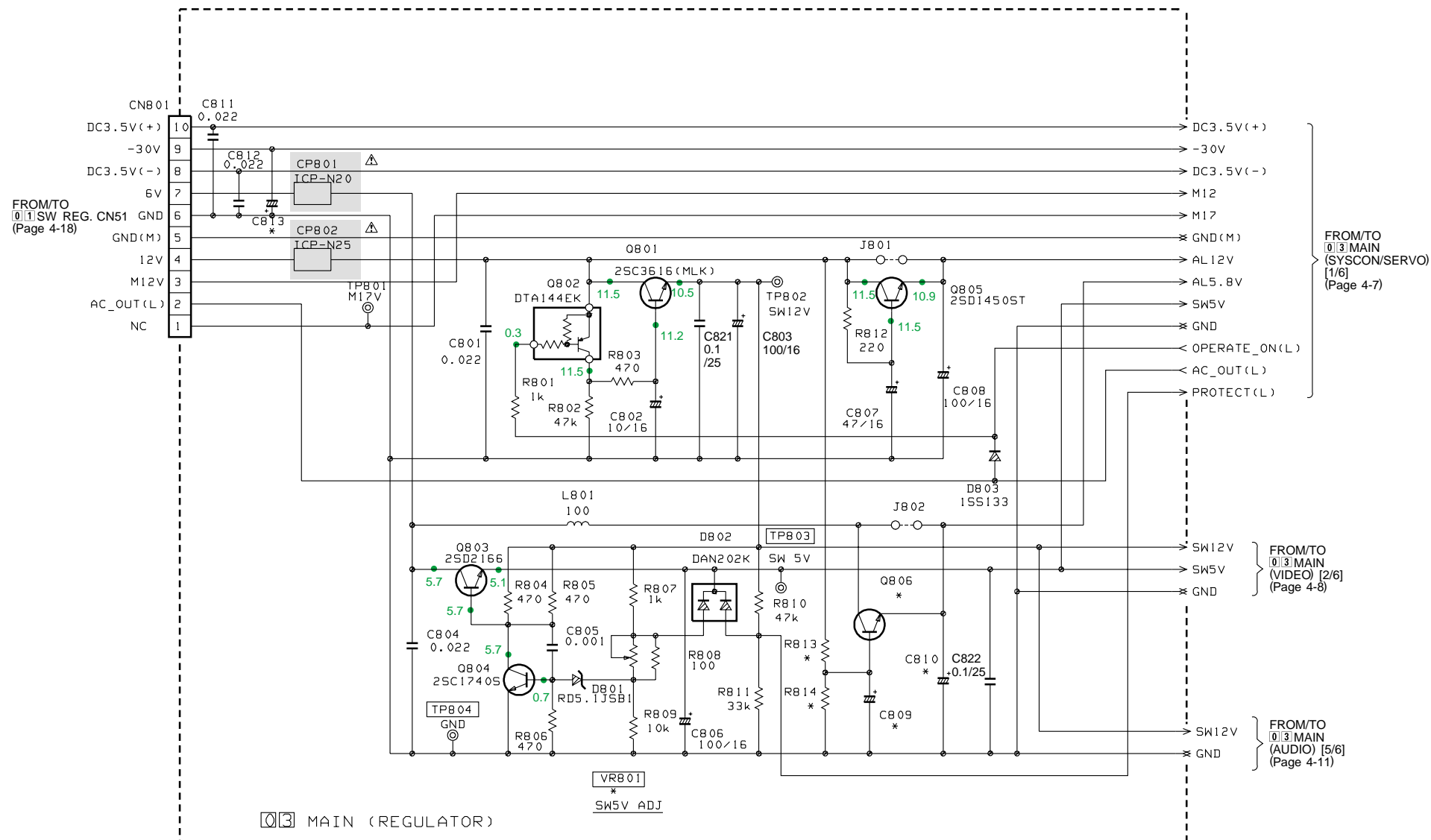


4.5 MAIN BOARD SCHEMATIC DIAGRAMS [6/6]

4.5.6 REGULATOR

IMPORTANT SAFETY NOTICE:

COMPONENTS IDENTIFIED WITH THE MARK  HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SAME TYPE.



✕ : OPEN 93092

SECTION 2

MECHANISM REPAIR/ADJUSTMENT PROCEDURES

2.1 BEFORE MAKING REPAIR/ADJUSTMENT

2.1.1 Precautions

- (1) When using the soldering iron, be sure to disconnect the power cord of the main unit from the AC outlet beforehand.
- (2) Pay attention not to damage the wires when connecting/disconnecting the connectors.
- (3) Do not touch the parts around the adjustment point because of wrongly specifying the defective point.
- (4) Pay special attention not to injure claws, etc. by accident during the repair operation.
- (5) When mounting the cassette housing assembly, set the unit exclusively to the mechanism assembly position. (Refer to Section 2.3.2.)
- (6) When remove any slit washers, replace them new one.

2.1.2 How to unload the cassette tape manually

When the unit malfunctions with the cassette tape being left loaded and the cassette tape cannot be ejected, remove the cassette tape in the following manner:

- (1) Be sure to disconnected the power cord and remove the top cover.
- (2) For unloading, rotate the loading motor in the main deck assembly manually toward you. At this time, unload the tape by rotating the capstan motor clockwise and winding the tape so that the grease does not come into contact with the slackened tape.
- (3) When the tape comes to the position where the pole base assemblies (supply side, take-up side) and guide arm assembly are hidden by the cassette shell, stop rotating the capstan motor, and check that the tape is fully wound up.
- (4) When the capstan motor is further rotated counterclockwise, the cassette housing is ejected, then the cassette tape may be removed.

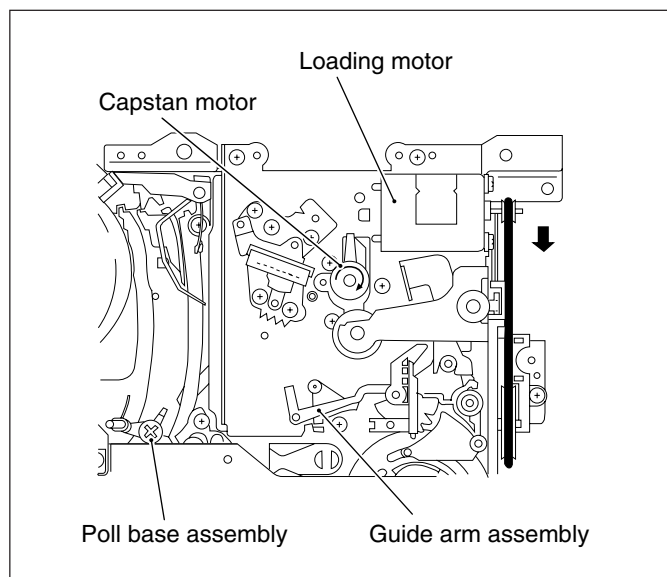


Fig. 2-1-1

2.1.3 Special tools Required for Adjustment

Alignment tape (SP) VFK1741	Alignment tape VFK1742
Cassette torque meter VFK1744	A/C head position bit VFK1745
Roller driver VFK1746	Grease VFK1748 / VFK1749 / VFK1750 Oil VFK1751
Parallel check plate (0.05) VFK1747	

Table 2-1-1 Special tools required for adjustment

2.1.4 Specifications of alignment tape

• VFK1741

Video Signal	Audio Signal	Applications
VHS SP Stairstep	6 kHz	<ul style="list-style-type: none"> • Interchangeability adjustment • PB switching point adjustment.

• VFK1742

Video Signal	Audio Signal	Applications
VHS SP Stairstep (1 field per 5 frame does not contain video and audio)	6 kHz	<ul style="list-style-type: none"> • X-value adjustment

2.2 MAINTENANCE AND CHECK

2.2.1 Location of main mechanical parts

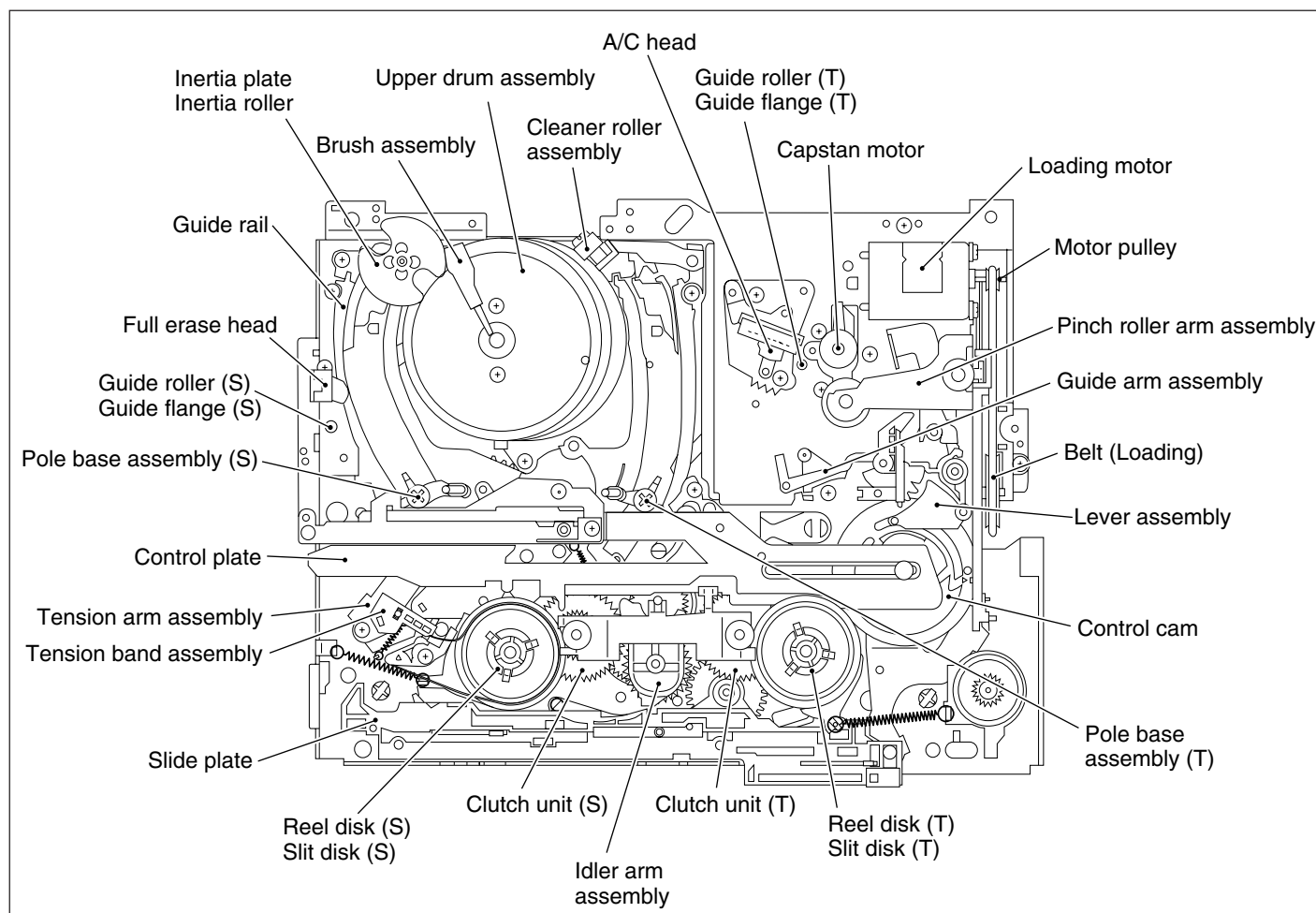


Fig. 2-2-1 Main deck top side

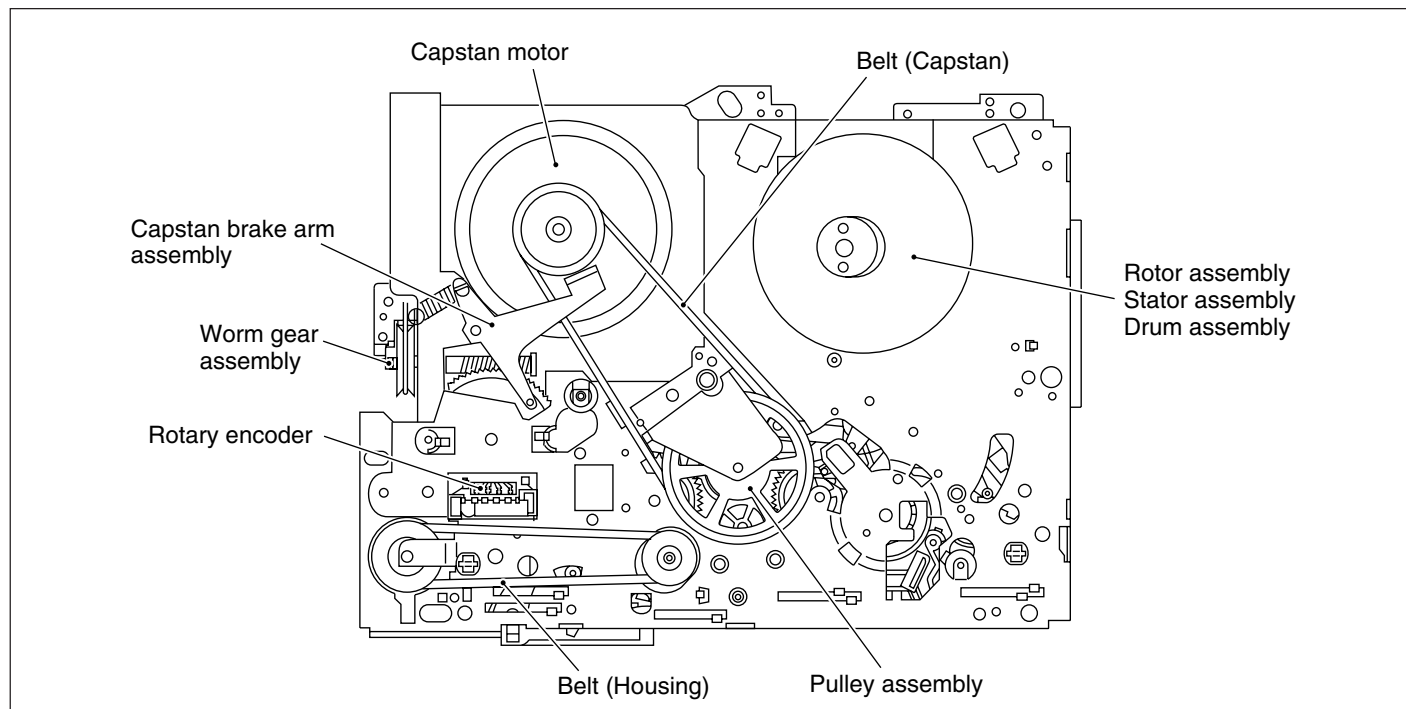


Fig.2-2-2 Main deck bottom side

2.2.2 Maintenance of main parts and periodical reference

This reference chart is based on the following status (see notes* below) and the service life (maintenance interval) may greatly differ depending on the environmental or using conditions. If the maintenance check is not performed correctly, the service

life shown in the following chart will be greatly reduced and it could affect the other units. However, it is recommended that rubber parts are replaced every three years as these could be affected by aging.

Category	Part Name		Symbol No. of Part and it appears in	Standard Service Period (Operation Hours)			Remarks
				every 500 hours	every 4000 hours	every 8000 hours	
Tape transport system	1	TAPE TRANSPORT PART	—	★	★	★	—
	2	GUIDE FLANGE (S, T)	M4-26	★	○★	○★	2.3.19
	3	FULL ERASE HEAD	M4-82	★	●	●	2.3.11
	4	POLE BASE ASSEMBLY (S)	M4-112	★	★	○★	2.3.18
	5	POLE BASE ASSEMBLY (T)	M4-113	★	★	○★	2.3.18
	6	A/C HEAD ASSEMBLY	M4-108	★	●	●	2.3.12
	7	CAPSTAN SHAFT	—	★	★	★	—
	8	PINCH ROLLER ARM ASSEMBLY	M4-107	★	●	●	2.3.6
	9	GUIDE ARM ASSEMBLY	M4-106	★	★	○★	2.3.20
	10	UPPER DRUM ASSEMBLY	M4-6B	★	●	●	2.3.3
	11	DRUM ASSEMBLY	M4-6	★	○	●	2.3.9
Drive system	12	CAPSTAN MOTOR	M4-72		○	●	2.3.8
	13	TENSION BAND ASSEMBLY	M4-89		○	●	2.3.7
	14	CLUTCH UNIT (S)	M4-104		○	△●	2.3.10
	15	CLUTCH UNIT (T)	M4-105		○	△●	2.3.10
	16	BELT	M4-38, 70, 78			●	2.3.13/2.3.14
	17	MAIN BRAKE (S) ASSEMBLY	M4-91			●	2.3.23
	18	MAIN BRAKE (T) ASSEMBLY	M4-93			●	2.3.23
	19	SUB BRAKE (S) ASSEMBLY	M4-92			●	2.3.17
	20	SUB BRAKE (T) ASSEMBLY	M4-94			●	2.3.16
	21	CAPSTAN BRAKE ARM ASSEMBLY	M4-123		●	●	2.3.8
	22	IDLER ARM ASSEMBLY	M4-103			●	2.3.15
	23	REEL DISK (S) (SPACER)	M4-95, 96, 97, 98			△○	2.3.10/16000h replacement
	24	REEL DISK (T)	M4-99, 100, 101			△○	2.3.10/16000h replacement
	25	SLIT DISK (S)	M4-35			△○	2.3.24/16000h replacement
	26	SLIT DISK (T)	M4-36			△○	2.3.24/16000h replacement
	27	WORM GEAR ASSEMBLY	M4-122			○	2.3.27/16000h replacement
	28	CONTROL CAM	M4-51			○	2.3.22/16000h replacement
	29	PULLEY ASSEMBLY	M4-102			○	2.3.26/16000h replacement
	30	CONTROL PALTE	M4-52			○	2.3.10
	31	SLIDE PLATE	M4-65			○	2.3.23
	32	LOADING ARM ASSEMBLY (S)	M4-114			○	2.3.25
	33	LOADING ARM ASSEMBLY (T)	M4-115			○	2.3.25
	34	LOADING MOTOR	M4-118			○	2.3.21
	35	MOTOR PULLEY	M4-119			○	2.3.21
Other	36	BRUSH ASSEMBLY	M4-12		●	●	2.3.4
	37	CLEANER ROLLER ASSEMBLY	M4-8		●	●	2.3.5
	38	ROTARY ENCODER	M4-84			○	2.3.22/16000h replacement
	39	CASSETTE HOUSING ASSEMBLY	M2-52			○	1.1

★: Cleaning ○: Check and replacement if required ●: Replacement △: Lubrication to the shaft

*Notes:

- Maintenance period is calculated assuming that the unit is continuously used in the 12H recording mode. For this reason, maintenance must be performed at a shorter interval than above when the unit is used in an operation condition in which the mode is frequently changed (such as VHS recording mode or Sensor REC mode).
- Read the drum hour meter for an indication of the service life (maintenance interval).

Table 2-2-1 Maintenance & Check Schedule

2.2.3 Cleaning

Periodical cleaning of the tape transport system is desirable. Therefore, perform cleaning when a set is brought in for repairs or maintenance. Contamination of the video heads, tape guides and brush can reduce playback picture quality and in extreme cases, even damage the tape.

- (1) To clean the video heads, press a quality moistened paper gently against the upper drum with fingertip and turn the drum counterclockwise by hand.

Note: Do not stroke it vertically, as this may damage the heads.

- (2) For cleaning of the tape transport mechanism parts other than the upper drum, use a close weave cloth or cotton swab dipped in alcohol.
- (3) After cleaning, be sure to check that the cleaned points are completely dry before loading the video tape.

2.2.4 Lubrication

It is not necessary to periodically lubricate oil or grease, apply lubrication to the new parts only when replacing them. If there is oil or grease at points which come into contact with the replaced parts, wipe it off and lubricate again.

- (1) For the points where oil or grease is to be applied, refer to the mechanism assembly exploded view diagram **M4**. For oil/grease to be used, refer to Table 2-2-2.

Classification	Name	Part No.	Symbol in Exploded View
Grease	Mal Temp SH-P	VFK1748	AA
Grease	Dry Surf	VFK1749	CC
Grease	Fuloil GB-TS-1	VFK1750	DD
Oil	Cosmo Hydro HV56	VFK1751	BB

Table 2-2-2 Greases and Oil used in the Unit

- (2) Grease is not required for a replacement cassette housing assembly, as this has been applied at the factory.

2.3 REPLACEMENT OF MAIN PARTS

2.3.1 Before removing

This locates the mechanism assembly positions where parts removal and reassembling are performed.

2.3.2 How to set to the mechanism assembly position

Remove the cassette housing assembly (refer to Section 1.1 “DISASSEMBLY OF MAJOR PARTS”), and rotate the mode motor so that the control cam positioning hole comes to the chassis hole on the main deck assembly. In this status, the unit is set at the mechanism assembly position.

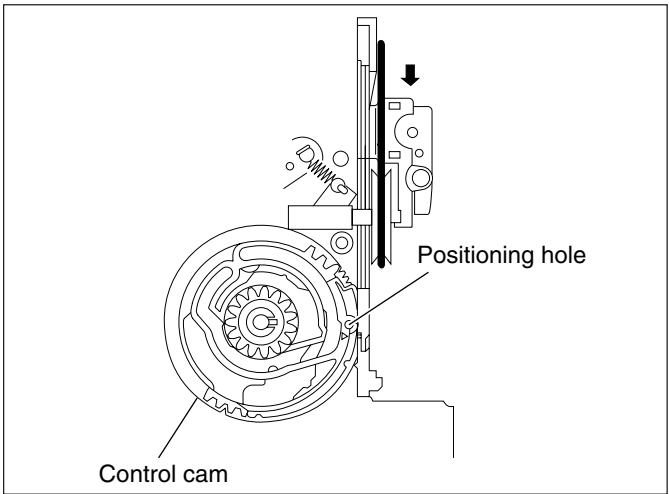


Fig. 2-3-1

2.3.3 Upper drum assembly

① How to remove

- (1) Remove the screw ① and remove the brush assembly.
- (2) Remove the inertia roller and the inertia plate.
- (3) Remove the two screws ② and remove the upper drum assembly.

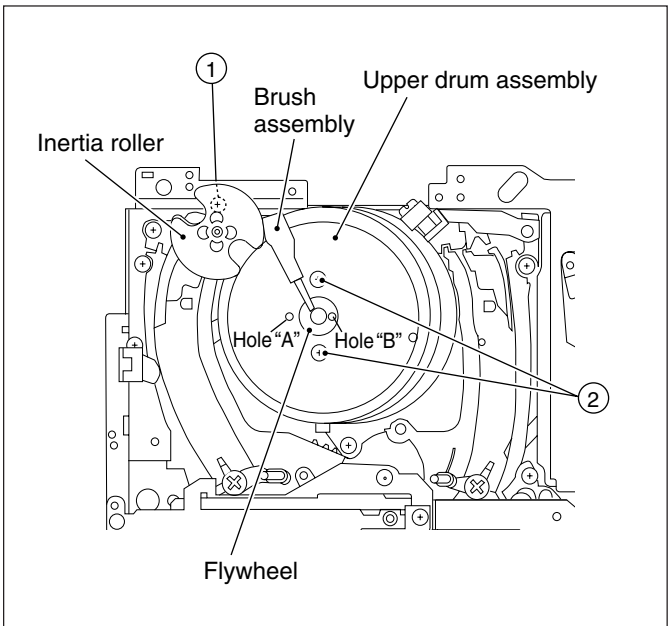


Fig. 2-3-2

② How to reassemble

- (1) Clean the mounting surface of the upper drum assembly and the lower drum assembly.
- (2) Set so that the hole "A" on the upper drum and the hole "B" on the flywheel come to opposite positions with an angle of 180°, and reassemble in the reverse order of removal.
- (3) After replacing the parts, clean the upper drum assembly and the lower drum assembly, and check the following adjustments:
 - Interchangeability adjustment (refer to Section 2.5)
 - Switching point adjustment (refer to Section 3.4.1)
 - V-lock adjustments (refer to Section 3.4.2)
 - Slow tracking preset adjustment (refer to Section 3.4.3)

2.3.4 Brush assembly

- (1) Remove the screw ① to replace the brush assembly. (Refer to Fig. 2-3-2.)

2.3.5 Cleaner roller assembly

- (1) Remove the slit washer.
- (2) Remove the cleaner roller assembly in the direction of the arrow, then attach the new cleaner roller assembly.

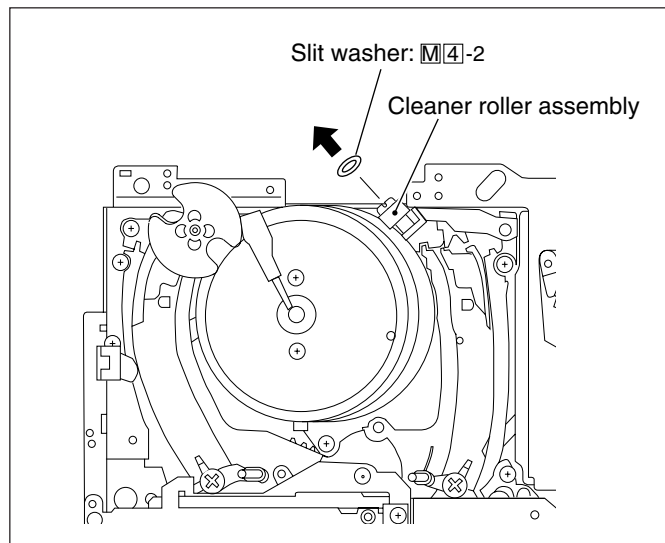


Fig. 2-3-3

2.3.6 Pinch roller arm assembly

① How to remove

- (1) Remove the slit washer.
- (2) While pushing aside the pinch plate in the direction of the arrow, remove the pinch roller arm assembly.

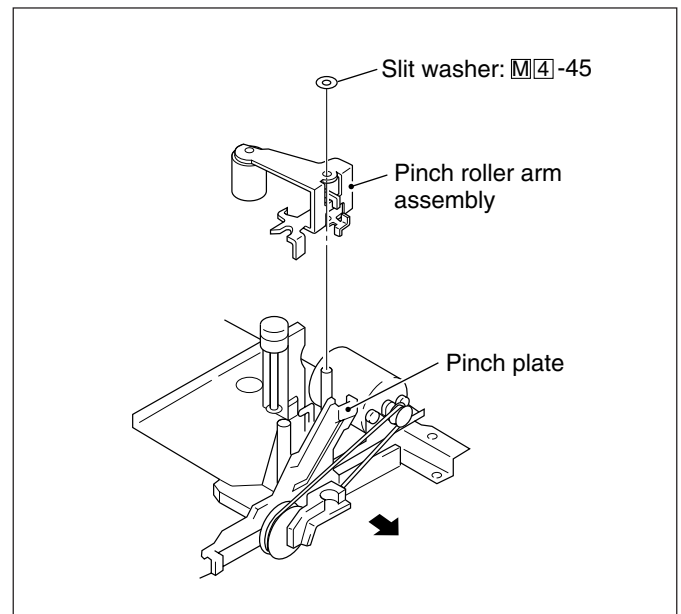


Fig. 2-3-4

② How to reassemble

- (1) Reassemble in the reverse order of removing.

2.3.7 Tension band assembly

① How to remove

- (1) Remove the screw ③.
- (2) While releasing the claws, remove the tension band assembly.

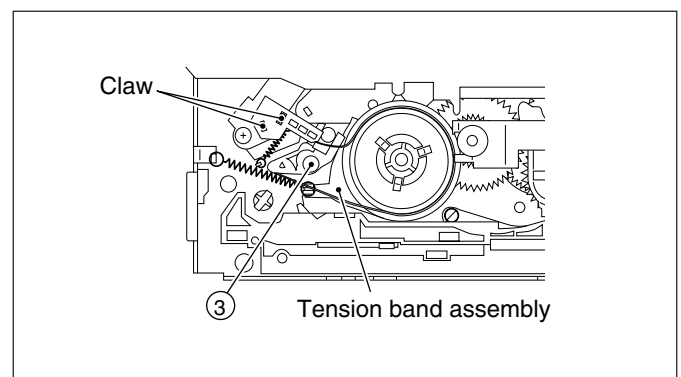


Fig. 2-3-5

② How to reassemble

- (1) Reassemble in the reverse order of removing.
- (2) After reassembling, check the following adjustment:
 - Tension arm position check/adjustment (refer to Section 2.5.4)

2.3.8 Capstan motor, Capstan brake arm assembly

① How to remove

- (1) Remove the mechanism assembly. (Refer to Section 1. 1 "DISASSEMBLY OF MAJOR PARTS".)
- (2) Remove the slit washer and remove the capstan brake arm assembly.
- (3) Remove the screw ⑮ and remove the SENSOR board.
- (4) Remove the belt.
- (5) Remove the three screws ④ and remove the capstan motor from the back of the mechanism assembly.

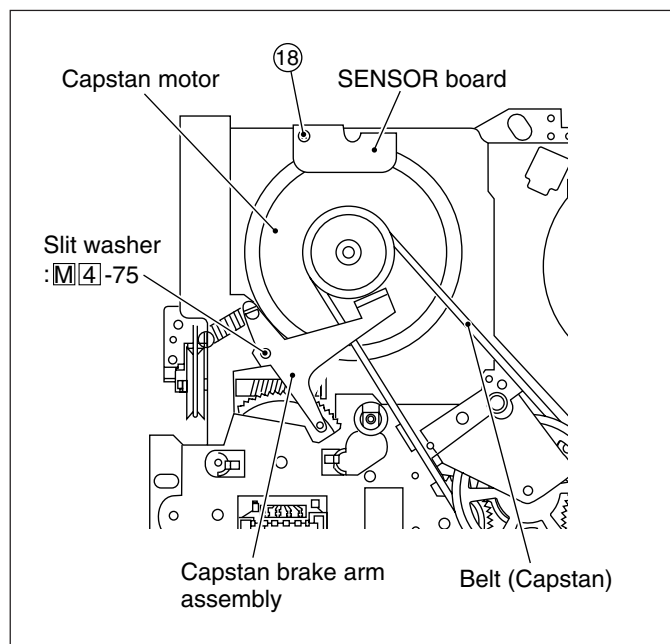


Fig. 2-3-6 (1)

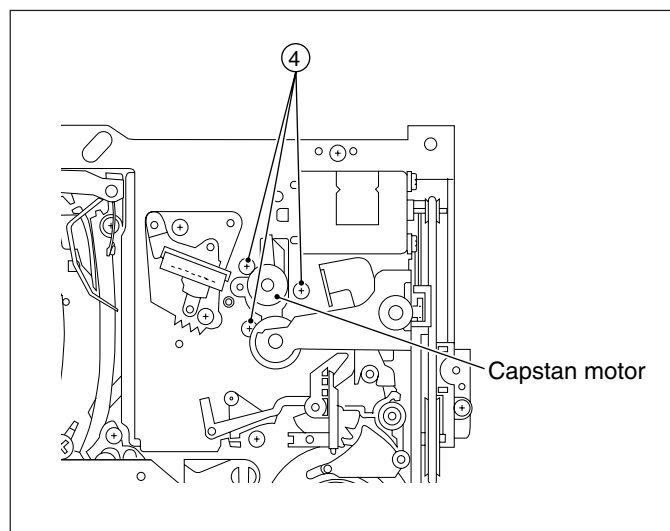


Fig. 2-3-6 (2)

② How to reassemble

- (1) Reassemble in the reverse order of removing.

2.3.9 Drum assembly

① How to remove

- (1) Remove the mechanism assembly. (Refer to Section 1. 1 "DISASSEMBLY OF MAJOR PARTS".)
- (2) Remove the screw ① and remove the brush assembly and inertia roller. (Refer to Fig. 2-3-2.)
- (3) Remove the two screws ⑤ and remove the rotor assembly.
- (4) Remove the three screws ⑥ and remove the stator assembly.
- (5) Be careful the drum assembly drop down, remove the three screws ⑦ and remove the drum assembly.

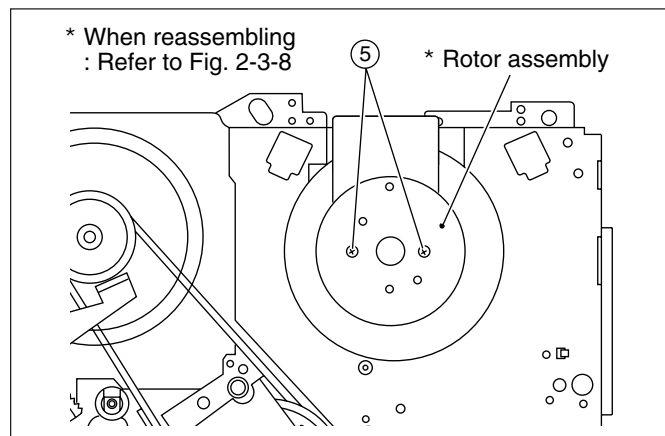


Fig. 2-3-7 (1)

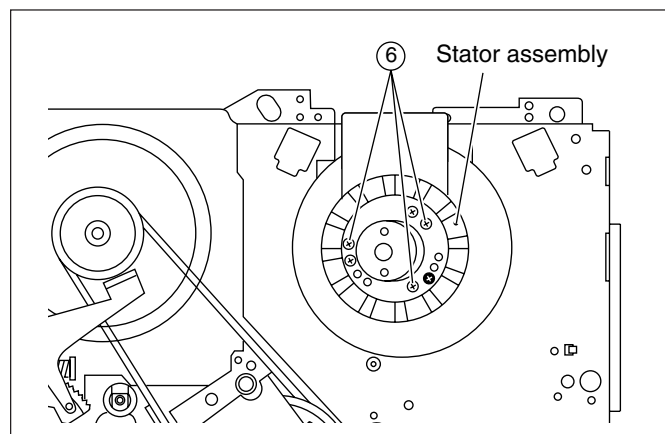


Fig. 2-3-7 (2)

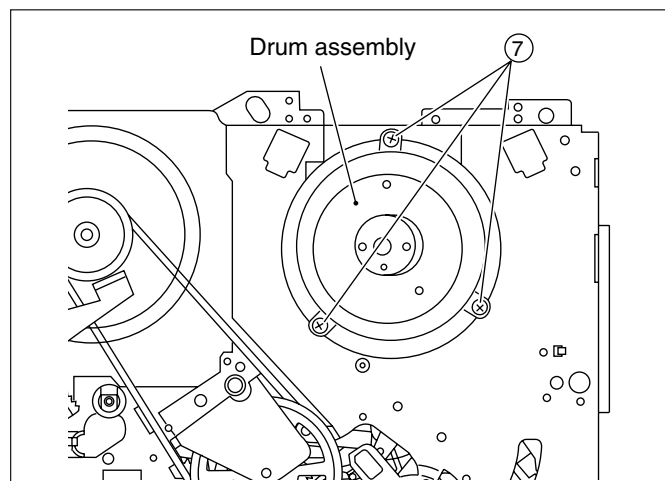


Fig. 2-3-7 (3)

② How to reassemble

- (1) Reassemble in the reverse order of removing.
- (2) After replacing the parts, clean the upper drum assembly and the lower drum assembly, then check the following adjustments:
 - Interchangeability adjustment (refer to Section 2.5)
 - Switching point adjustment (refer to Section 3.4.1)
 - V-lock adjustments (refer to Section 3.4.2)
 - Slow tracking preset adjustment (refer to Section 3.4.3)
 - Skew adjustment (refer to Section 3.4.4)

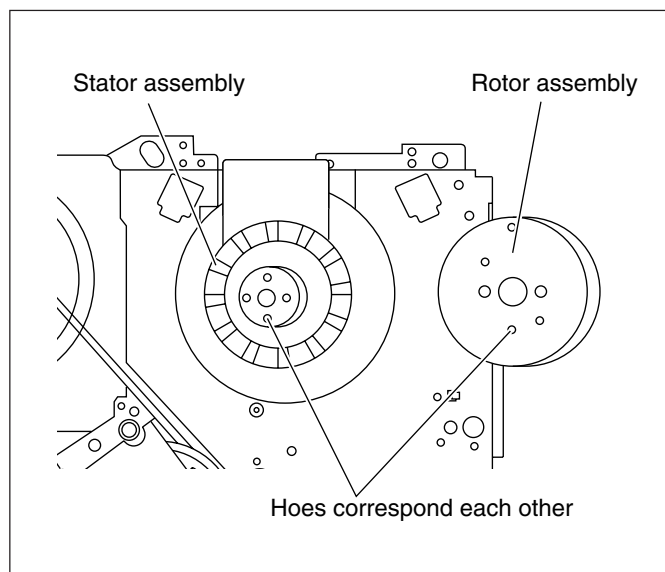


Fig. 2-3-8

2.3.10 Clutch unit (S, T), Control plate, Reel disk (S, T)

① How to remove

- (1) Remove the two slit washers and then remove the reel bracket.

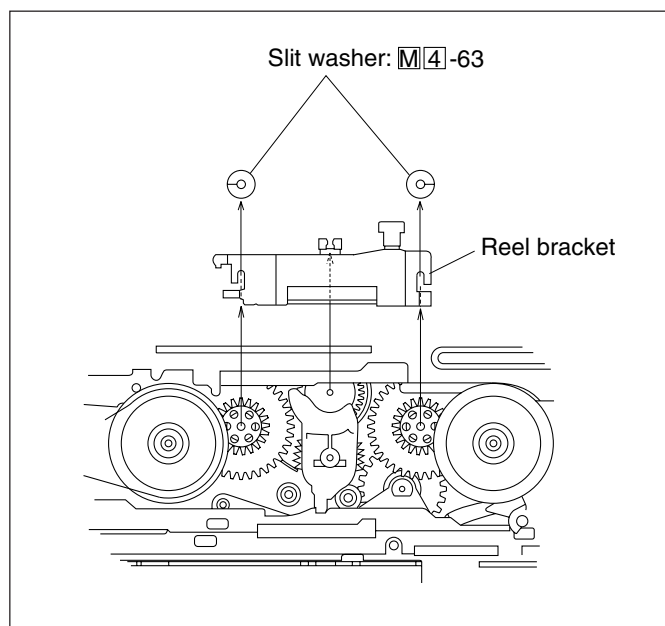


Fig. 2-3-9 (1)

- (2) Release the claw and then release the tension band assembly from the reel disk (S). (Refer to Fig. 2-3-5.)
- (3) Remove the reel disks (S, T).
- (4) Remove the screw ⑧ and remove the control bracket 2.

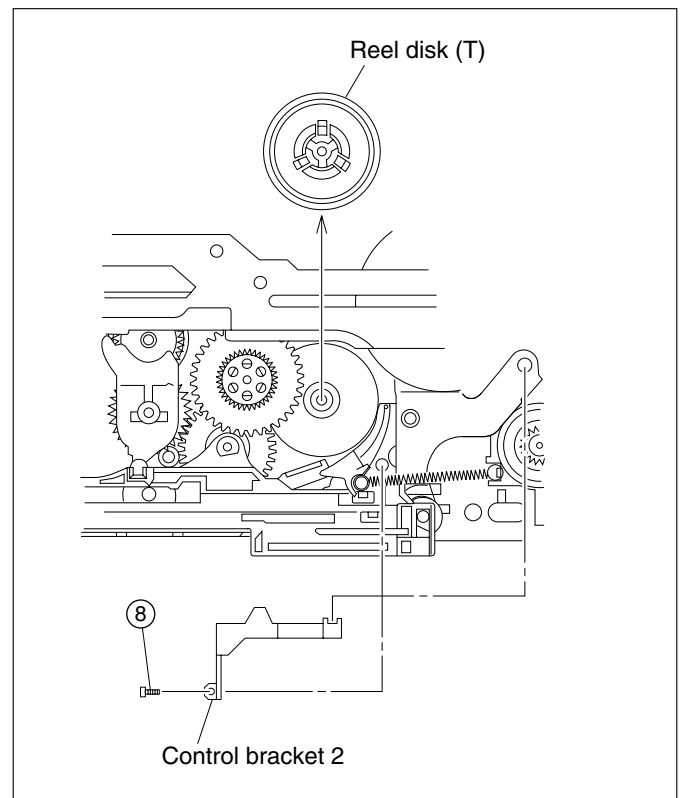


Fig. 2-3-9 (2)

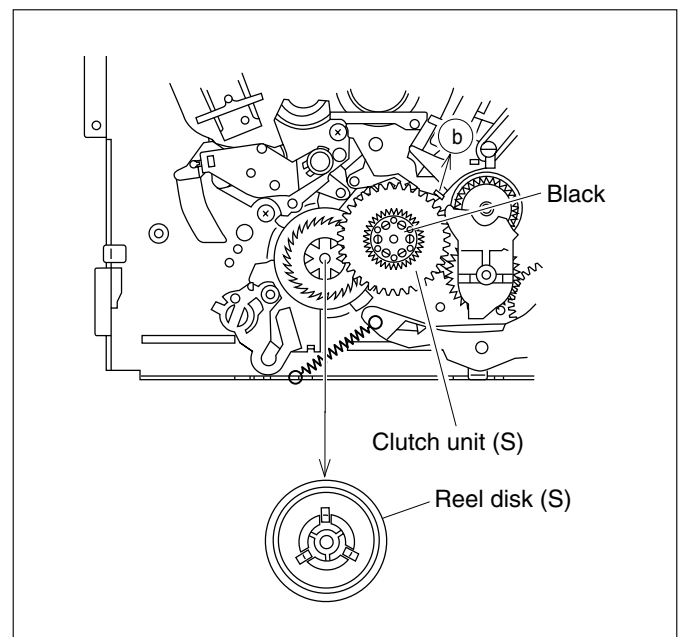


Fig. 2-3-9 (3)

- (5) Remove the screw ⑨ and screw ⑩.
- (6) Remove the earth plate and the control bracket.

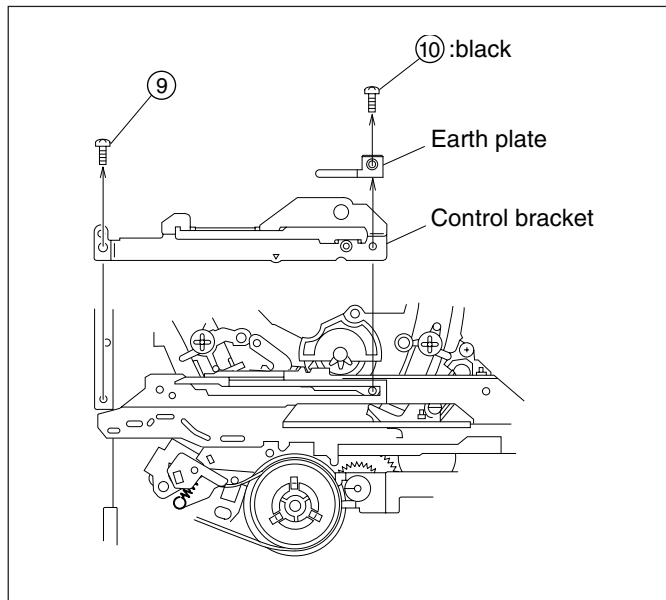
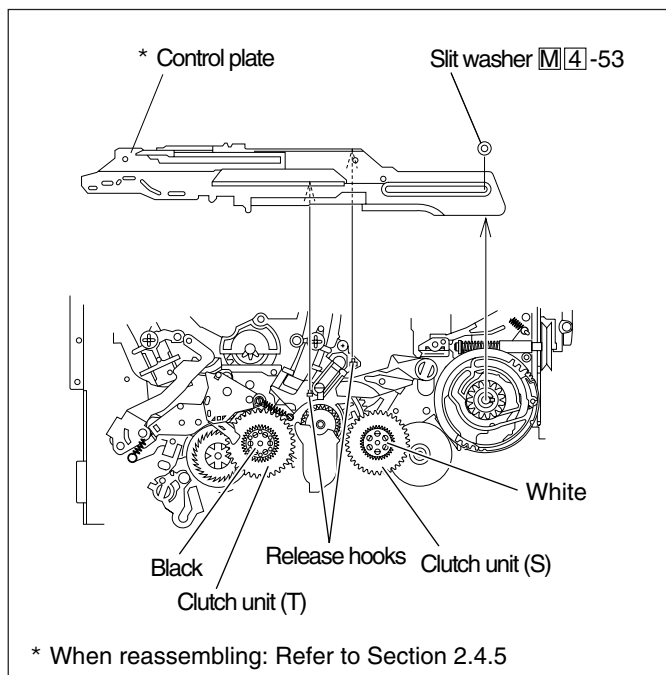


Fig. 2-3-9 (4)

- (7) Remove the slit washer.
- (8) Release the hooks at the two points and remove the control plate.
- (9) Remove the clutch units (S, T).



* When reassembling: Refer to Section 2.4.5

Fig. 2-3-9 (5)

② How to reassemble the reel disk (S.T)

- (1) Reel disk (S)

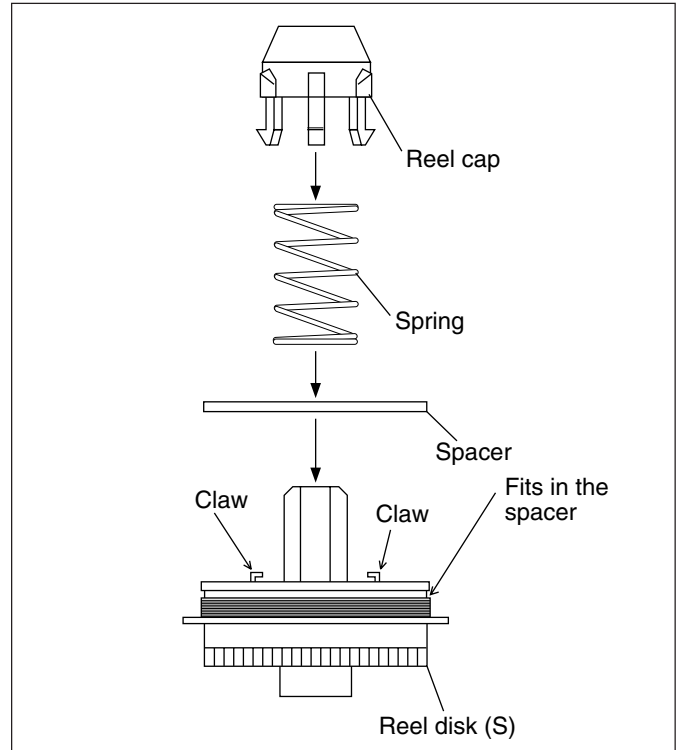


Fig. 2-3-10

- (2) Reel disk (T)

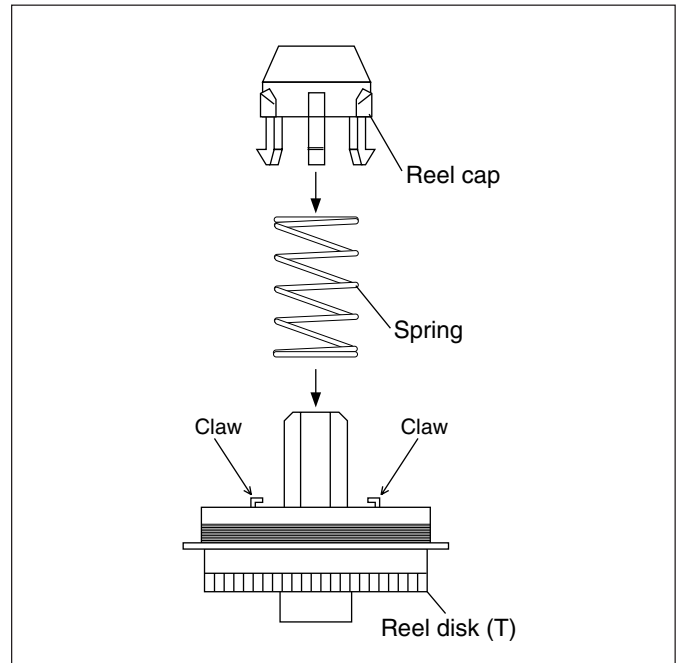


Fig. 2-3-11

③ How to reassemble

- (1) Reassemble in the reverse order of removing.
- (2) When mounting the control plate, set the phase of the control plate appropriately by referring the "How to mount the main parts".
(Refer to Section 2.4.5.)

2.3.11 Full-erase head

- (1) Remove the wire.
- (2) Remove the screw ⑪ and remove the full-erase head for replacement.

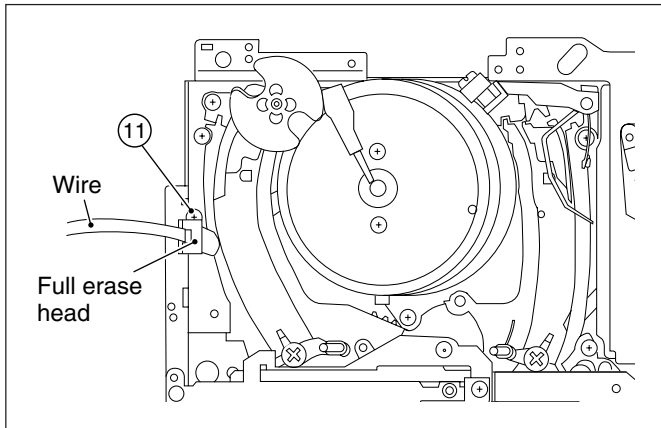


Fig. 2-3-12

2.3.12 A/C head assembly

① How to remove

- (1) Remove the wire.
- (2) Remove the two screws ⑫ and remove the head base.
- (3) Remove the three screws ⑬ and remove the A/C head assembly.

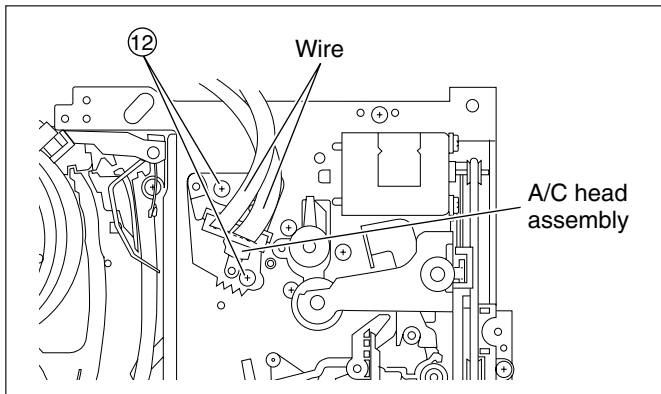


Fig. 2-3-13 (1)

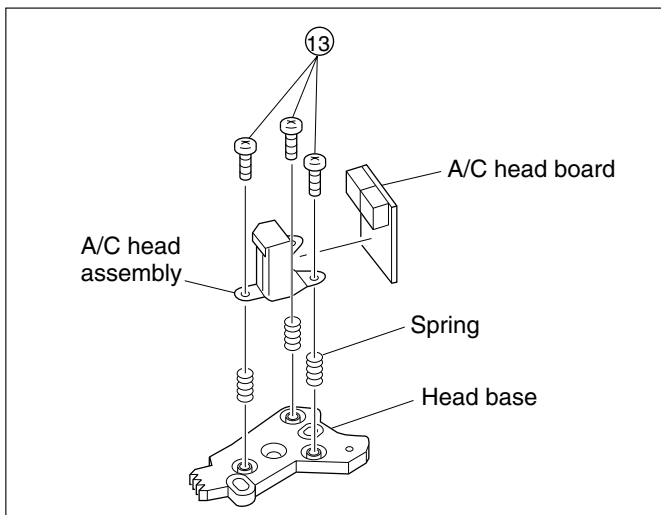


Fig. 2-3-13 (2)

② How to reassemble

- (1) To make the adjustment after reassembling easier, set the mounting height temporarily, then reassemble in the reverse order of removing.

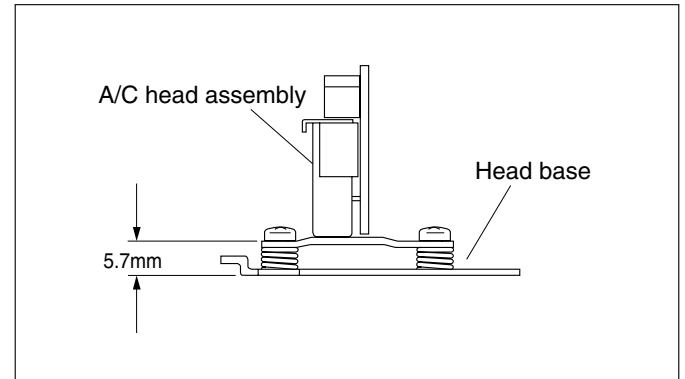


Fig. 2-3-14

- (2) After reassembling, clean the A/C head and perform the following adjustment:

- Interchangeability adjustment (refer to Section 2.5)

2.3.13 Belt (Loading)

- (1) Remove the belt (loading) from the worm gear and motor pulley.

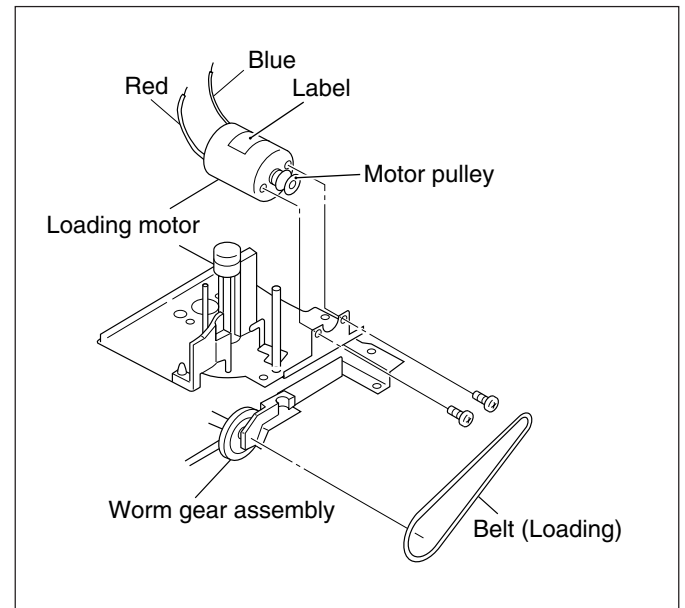


Fig. 2-3-15

2.3.14 Belt (Capstan, Housing)

① How to remove

- (1) Remove the mechanism assembly. (Refer to Section 1. 1 "DISASSEMBLY OF MAJOR PARTS".)
- (2) Remove the belts from the pulleys at each point, and replace them with new ones.

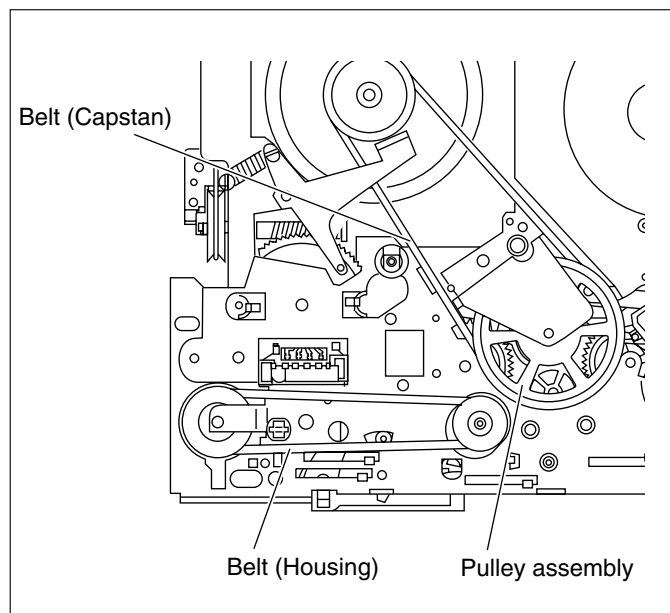


Fig. 2-3-16

2.3.15 Idler assembly

① How to remove

- (1) Remove the two slit washers and remove the reel bracket. (Refer to Fig. 2-3-9(1).)
- (2) Remove the control plate. (Refer to Section 2.3.10.)
- (3) Release the idler lever while push the idler assembly, take out the idler assembly.

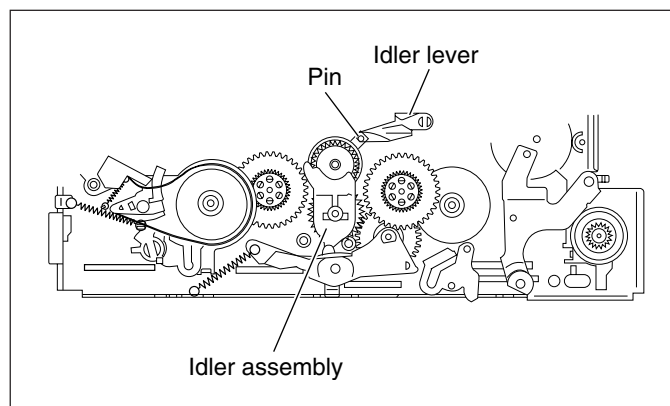


Fig. 2-3-17

② How to reassemble

- (1) Reassemble in the reverse order of removing.

2.3.16 Sub brake assembly (T)

① How to remove

- (1) Remove the two slit washers and then remove the reel bracket. (Refer to Fig. 2-3-9 (1).)
- (2) Take out the reel disk (T). (Refer to Fig. 2-3-9 (2).)
- (3) Remove the spring in the sub-brake assembly, and remove the sub brake assembly by releasing the hook.

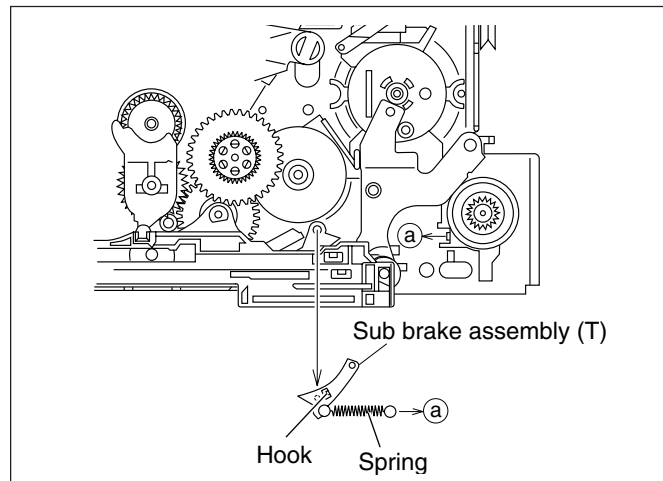


Fig. 2-3-18

② How to reassemble

- (1) Reassemble in the reverse order of removing.

2.3.17 Sub brake assembly (S)

① How to remove

- (1) Remove the two slit washers and remove the reel bracket. (Refer to Fig. 2-3-9 (1).)
- (2) Release the catch and release the tension band assembly from the reel disk (S). (Refer to Fig. 2-3-5.)
- (3) Take out the reel disk (S).
- (4) Remove the spring in the sub brake assembly (S), and take out the sub brake assembly.

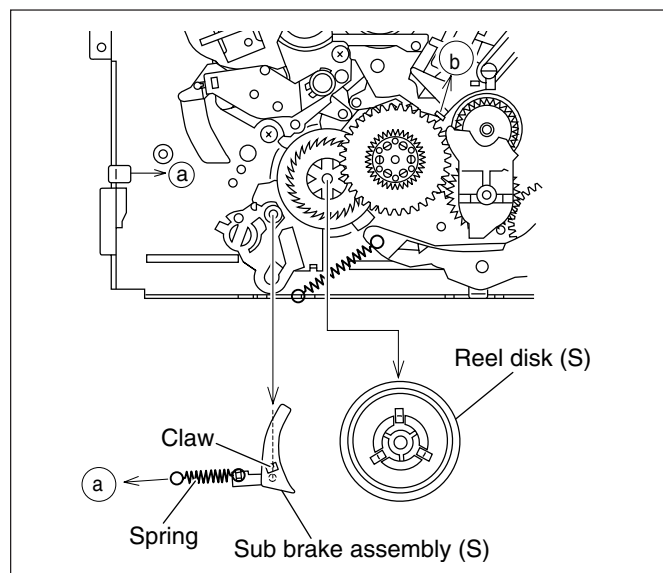


Fig. 2-3-19

② How to reassemble

- (1) Reassemble in the reverse order of removing.

2.3.18 Pole base assembly (S, T)

① How to remove

- (1) Remove the slit washer and take out the release arm and head cleaner arm assembly.
- (2) Remove the two screws (14). (Refer to Fig. 2-3-20 (2).)
- (3) Rotate the loading motor toward you, and shift the pole base assembly to near the loading end position. (Refer to Fig. 2-3-20 (2).)

Note: • If the control plate is removed, shift the pole base assembly by hand.

- (4) While releasing the hook of the pole base assembly from the guide rail and the pin of it from the loading arm, take out the pole base assembly.

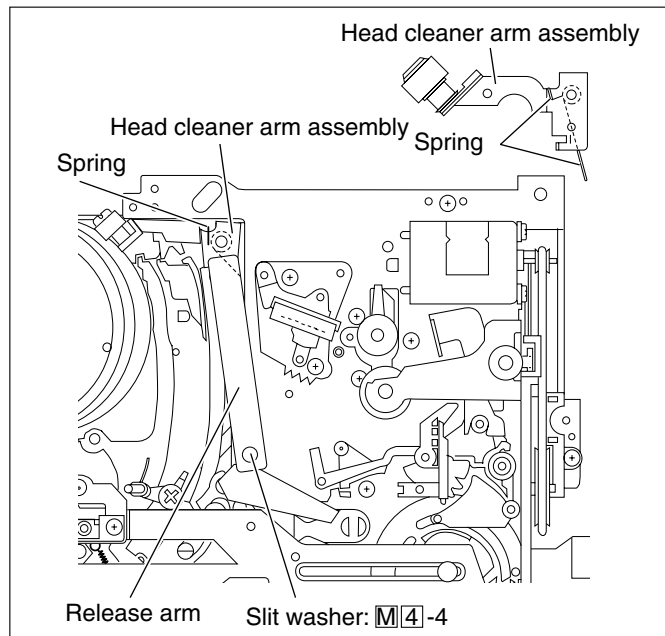


Fig. 2-3-20 (1)

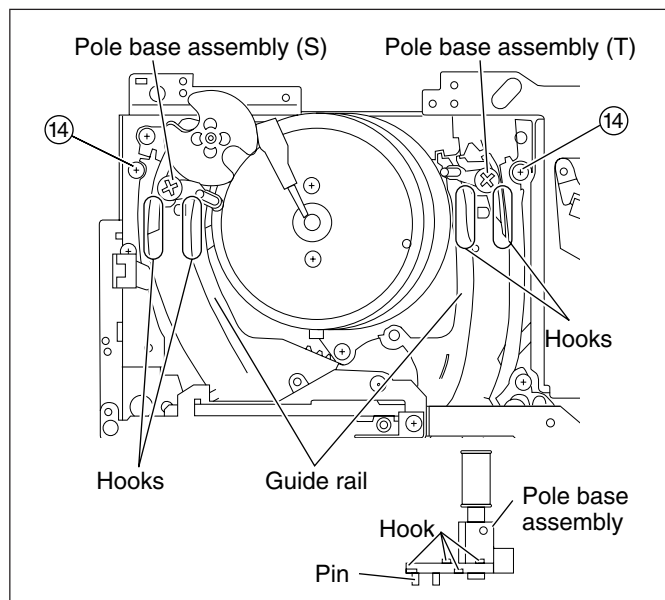


Fig. 2-3-20 (2)

② How to reassemble

- (1) Reassemble in the reverse order of removing.

- (2) After reassembling, clean the pole base assemblies (S, T) and perform the following adjustments:
 - Tape transport check/adjustment (refer to Section 2.5.6)
 - Interchangeability adjustment (refer to Section 2.5)

2.3.19 Guide flange (S, T)

① How to remove

- (1) Remove the two screws (15).
- (2) Take out the guide roller (S, T) and guide flanges (S, T).

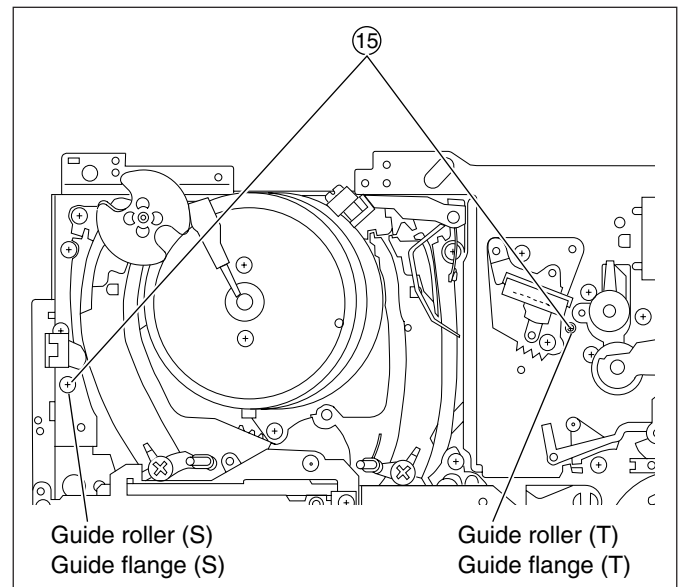


Fig. 2-3-21

② How to reassemble

- (1) Reassemble in the reverse order of removing.
- (2) To make the tape transport adjustment easier after replacement, tighten the screw once until it reaches the end, then rotate it by the following value in the releasing direction to set the temporary height.
 - Guide flange (S)..... 2.5 turns
 - Guide flange (T)..... 1.5 turns

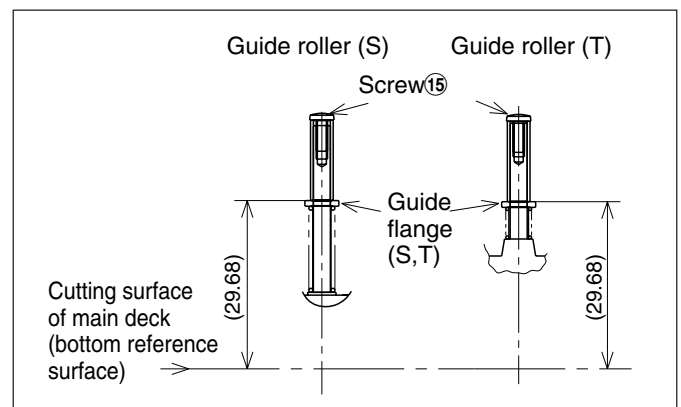


Fig. 2-3-22

- (3) After setting the temporary height, check the following adjustments:
 - Interchangeability adjustment (refer to Section 2.5)

2.3.20 Guide arm assembly

① How to remove

- (1) While releasing the hook remove the lid guide.
- (2) Remove the spring.
- (3) Remove the Guide arm assembly.

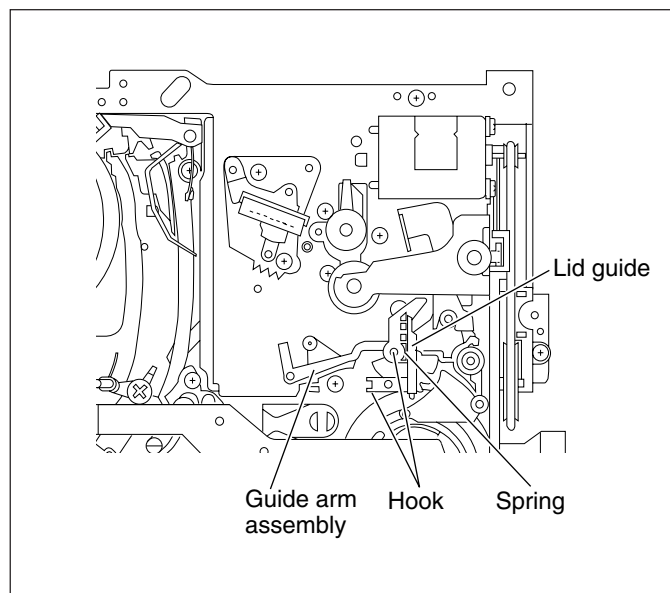


Fig. 2-3-23

② How to reassemble

- (1) Reassemble in the reverse order of removing.
- (2) After replacing the parts, clean the guide arm assembly and check the following adjustments:
 - Interchangeability adjustment (refer to Section 2.5)

2.3.21 Loading motor, Motor pulley

① How to remove

- (1) Remove the belt from the motor pulley.
- (2) Remove the connector CN401 from the P/R board and remove the wire from the loading motor.
- (3) Remove the two screws (16) and remove the loading motor.
- (4) De-solder the wire and remove it from the loading motor.

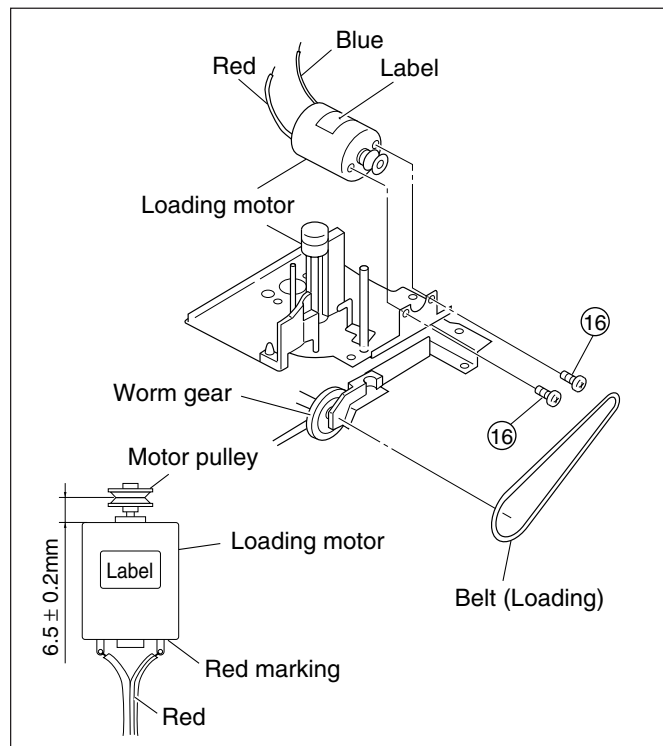


Fig. 2-3-24

② How to reassemble

- (1) Mount the loading motor and motor pulley as shown in Fig. 2-3-24.
- (2) Reassemble in the reverse order of removing.

2.3.22 Rotary encoder, Control cam

① How to remove

- (1) Remove the reek disk (T) and the control plate. (Refer to Section 2.3.11.)
- (2) Remove the slit washer and remove the lever assembly.

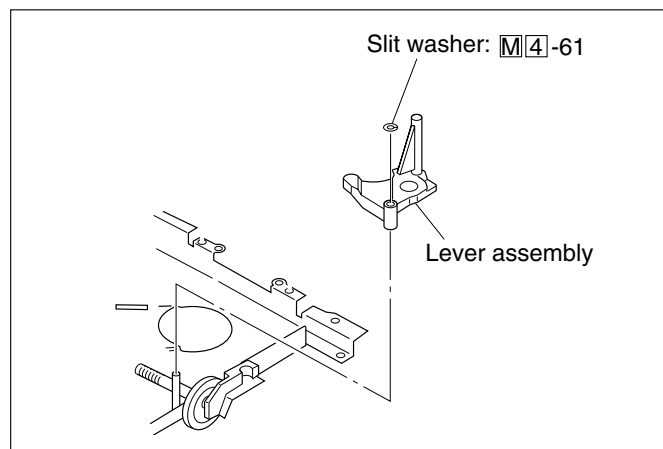


Fig. 2-3-25 (1)

- (3) While releasing the claw of pinch plate, slide it backwards.
- (4) While releasing the claw and rotating the guide arm assembly by clockwise, remove the control cam.

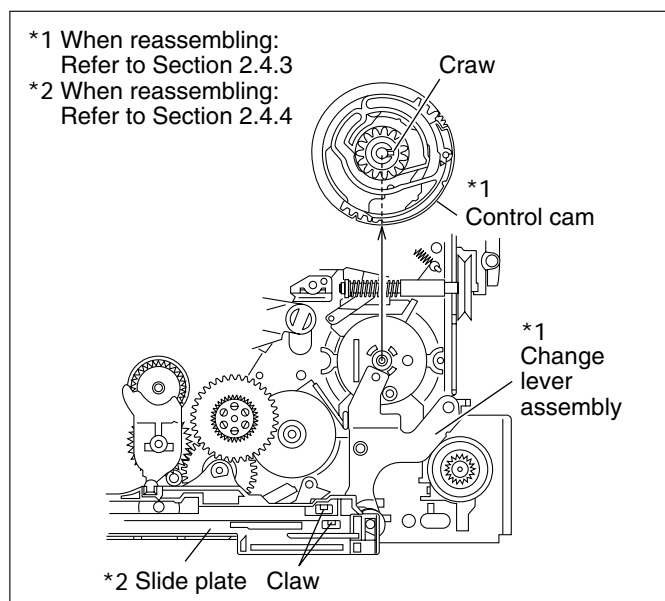


Fig. 2-3-25 (2)

- (4) Remove the slide plate. (Refer to Section 2.3.23.)
- (5) Take out the change lever assembly.
- (6) While releasing the crows at both sides, take out the rotary encoder.

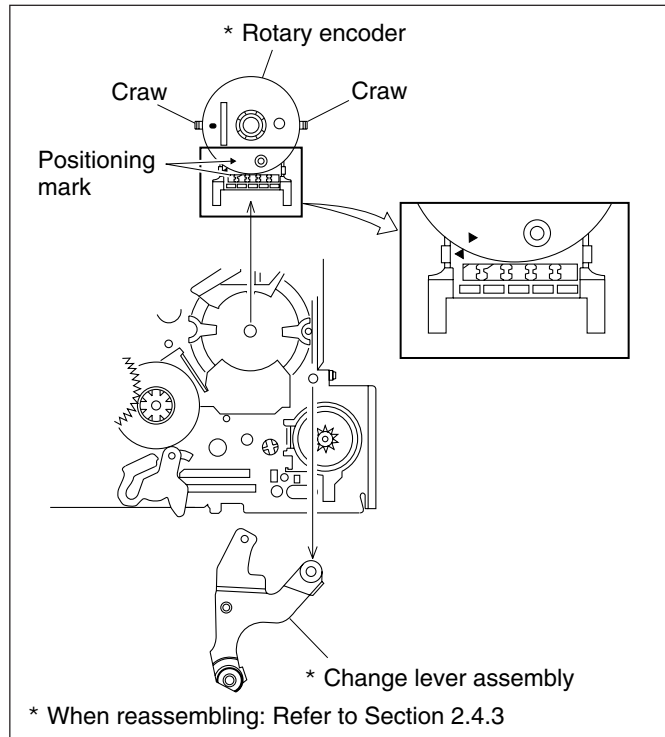


Fig.2-3-25 (3)

② How to reassemble

- (1) Reassemble in the reverse order of removing.
- (2) When mounting the rotary encoder, control cam or control plate, set the phases of each part appropriately by referring to the "How to mount the main parts". (Refer to Section 2.4.3 and Section 2.4.5.)

2.3.23 Slide plate, Main brake assembly (S, T)

① How to remove

- (1) Remove the mechanism assembly. (Refer to Section 1. 1 "DISASSEMBLY OF MAJOR PARTS".)
- (2) Remove the sub brake assembly (T). (Refer to Section 2.3.16.)
- (3) Remove the sub brake assembly (S). (Refer to Section 2.3.17.)
- (4) Release the seven crows from the back of the mechanism assembly, and take out the slide plate from the front surface of the mechanism assembly.
- (5) Remove the slit disk (S). (Refer to Section 2.3.24.)
- (6) Take out the main brake assembly (T).
- (7) While rotating the main brake assembly, take it out.

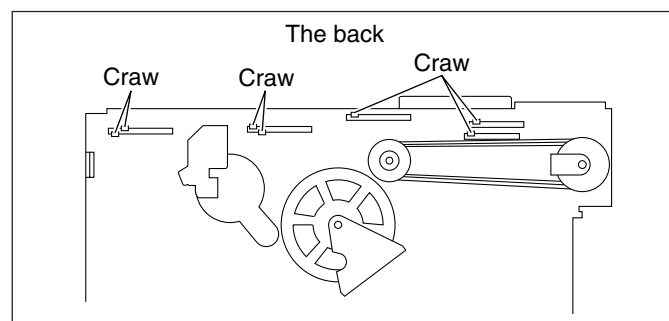


Fig.2-3-26 (1)

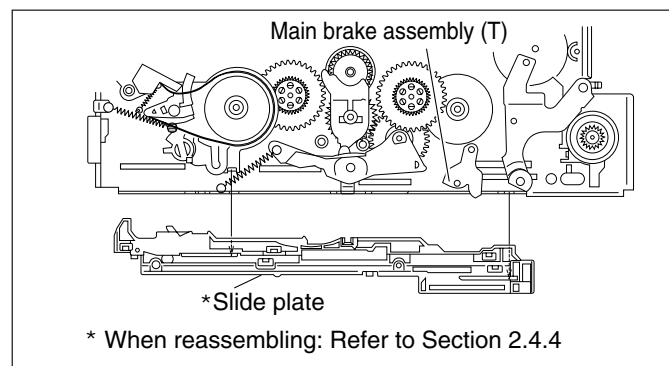


Fig. 2-3-26 (2)

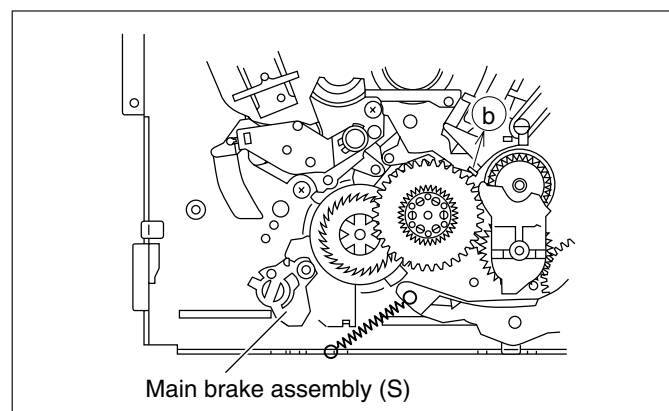


Fig. 2-3-26 (3)

② How to reassemble

- (1) Reassemble in the reverse order of removing.
- (2) When mounting the slide plate, set the phases of each part appropriately by referring the "How to mount the main parts". (Refer to Section 2.4.4.)

2.3.24 Slit disk (S, T)

① How to remove

- (1) Remove the reel disks (S, T), control plate and clutch units (S, T). (Refer to Section 2.3.10.)
- (2) While releasing the take up head and tension arm lever (Refer to Fig. 2-3-28 (2)), take out the slit disks (S, T).

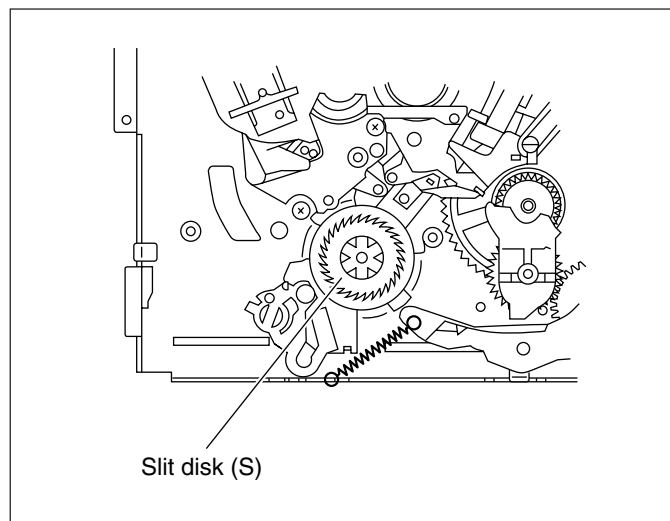


Fig. 2-3-27 (1)

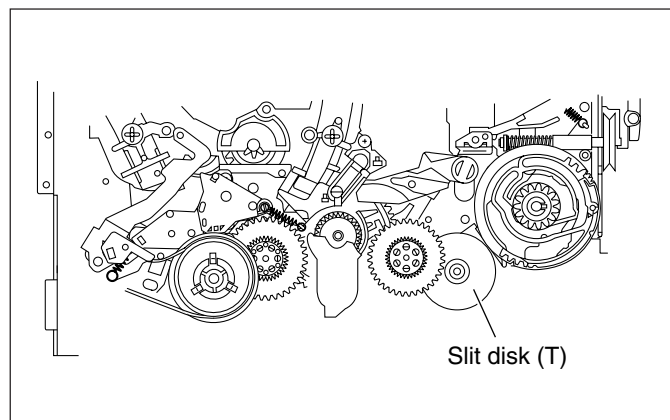


Fig. 2-3-27 (2)

② How to reassemble

- (1) Reassemble in the reverse order of removing.

2.3.25 Guide rail, Loading arm assembly (S, T)

① How to remove

- (1) Remove the brush assembly and inertia roller. (Refer to Section 2.3.3.)
- (2) Remove the reel disk (S), control plate and clutch unit (S). (Refer to Section 2.3.10.)
- (3) Remove the slit washer and remove the tension arm .
- (4) Take out the take-up lever, tension arm lever and take-up head.
- (5) Remove the pole base assembly. (Refer to Section 2.3.18.)

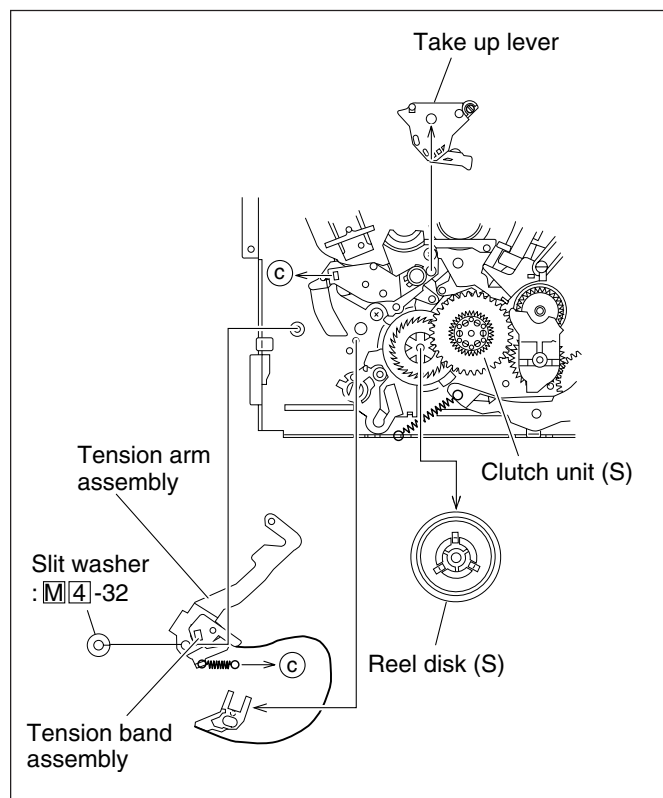


Fig. 2-3-28 (1)

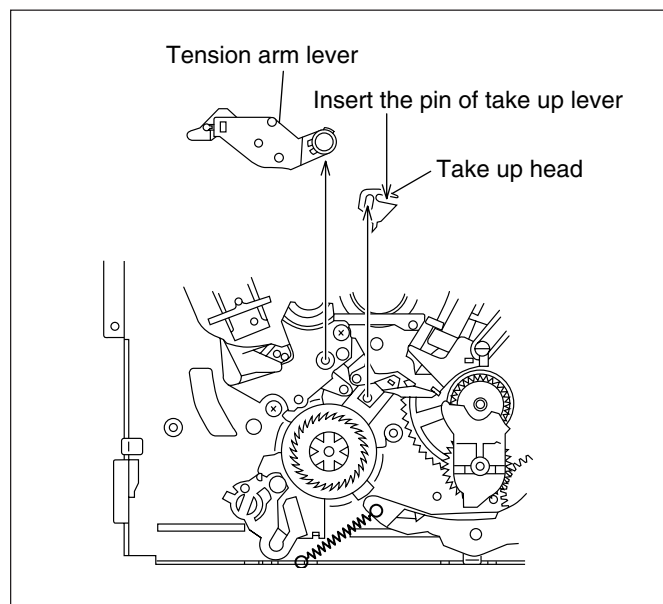


Fig. 2-3-28 (2)

- (6) Remove the five screws ⑰, and remove the guide rail by releasing the claw.
- (7) Take out the loading arm assemblies (S, T).

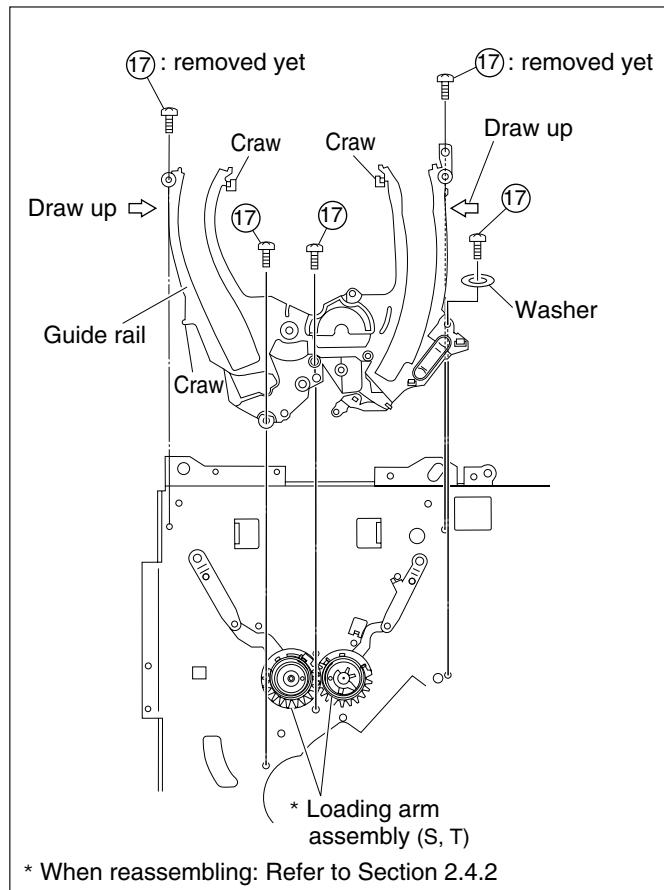


Fig. 2-3-28 (3)

② How to reassemble

- (1) Reassemble in the reverse order of removing.
- (2) When mounting the loading arm assembly and control plate, set the phases of each part appropriately by referring to the "How to mount the main parts". (Refer to Section 2.4.1 and 2.4.5.)
- (3) After replacing the parts, clean the pole base assemblies (S, T), and check the following adjustments:
 - Tape transport system check/adjustment. (Refer to Section 2.5.6.)
 - Interchangeability adjustment. (Refer to Section 2.5.)

2.3.26 Pulley assembly

① How to remove

- (1) Remove the clutch units (S, T), control plate and reel disks (S,T). (Refer to Section 2.3.10.)
- (2) Remove the idler assembly. (Refer to Section 2.3.15.)
- (3) Remove the pole base assembly and guide rail. (Refer to Section 2.3.18 and 2.3.25.)
- (4) Remove the screw ⑰ and remove the idler lever.

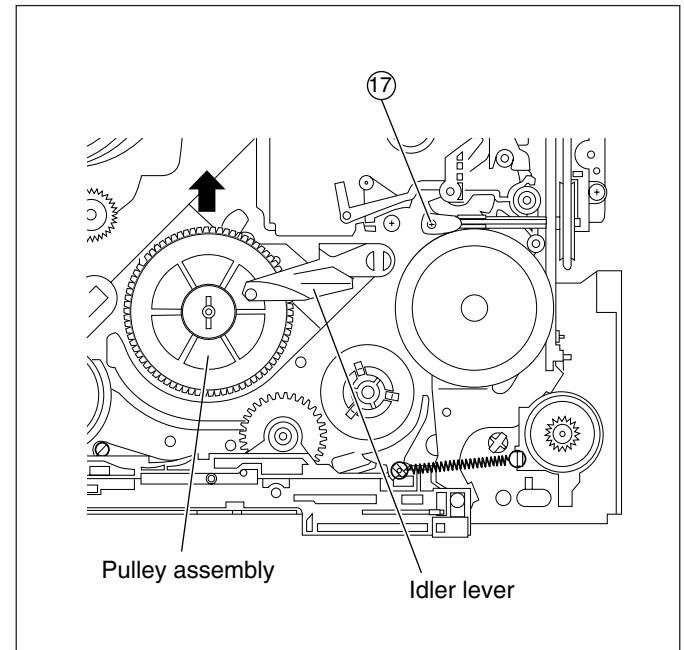


Fig. 2-3-29

- (5) Remove the belt (capstan) from the pulley assembly. (Refer to Fig. 2-3-16.)
- (6) Take out the pulley assembly.

② How to reassemble

- (1) Reassemble in the reverse order of removing.
- (2) When mounting the guide rail and control plate, set the phases of each part appropriately by referring to the "How to mount the main parts". (Refer to Section 2.4.2 and 2.4.5.)

2.3.27 Worm gear assembly

① How to remove

- (1) Remove the control plate. (Refer to Section 2.3.10.)
- (2) Remove the control cam. (Refer to Section 2.3.22.)
- (3) Remove the guide arm assembly. (Refer to Section 2.3.20.)
- (4) Remove the pinch roller arm assembly. (Refer to Section 2.3.6.)
- (5) While releasing the craws, remove the pinch plate.

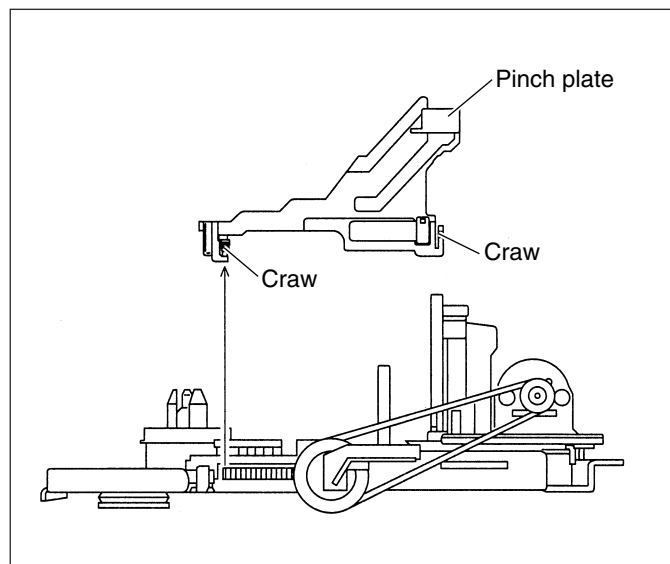


Fig. 2-3-30 (1)

- (6) Remove the worm gear assembly by lifting the right side of the worm gear assembly.

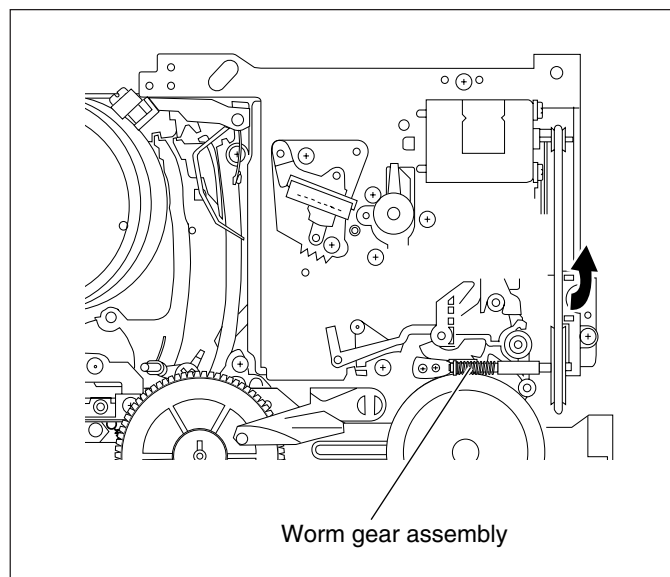


Fig. 2-3-30 (2)

② How to reassemble

- (1) Reassemble in the reverse order of removing.
- (2) When mounting the control plate and control cam, set the phases of each part appropriately by referring to the "How to mount the main parts". (Refer to Section 2.4.3 and 2.4.5.)

2.4 HOW TO MOUNT THE MAIN PARTS (Mechanism Phase Adjustment)

2.4.1 Before parts assembling

The mechanism used in this unit has a close relationship between the rotary encoder and the mechanism control circuit. Therefore, the relationship between the rotary encoder and the control cam determines all the operations of the mechanism parts including the slide plate, loading arm assembly, control plate and brake. If these parts are not mounted at the correct positions, loading/unloading operation will not be performed. Mounting the main parts (mechanism phase adjustment) must be performed at the mechanism assembly position in the same way as in the previous section.

2.4.2 Loading arm assembly (S, T)

- (1) Mount the loading arm assembly (S) and the loading arm assembly (T) so that the positioning marks on both gears come face to face with each other.
- (2) After mounting the guide rail and setting the pole base assembly at the tip of the arm, perform the unloading operation so that the pole base assembly returns to the forefront position.
- (3) Mount the peripheral parts around the guide rail. (Refer to Section 2.3.25.)

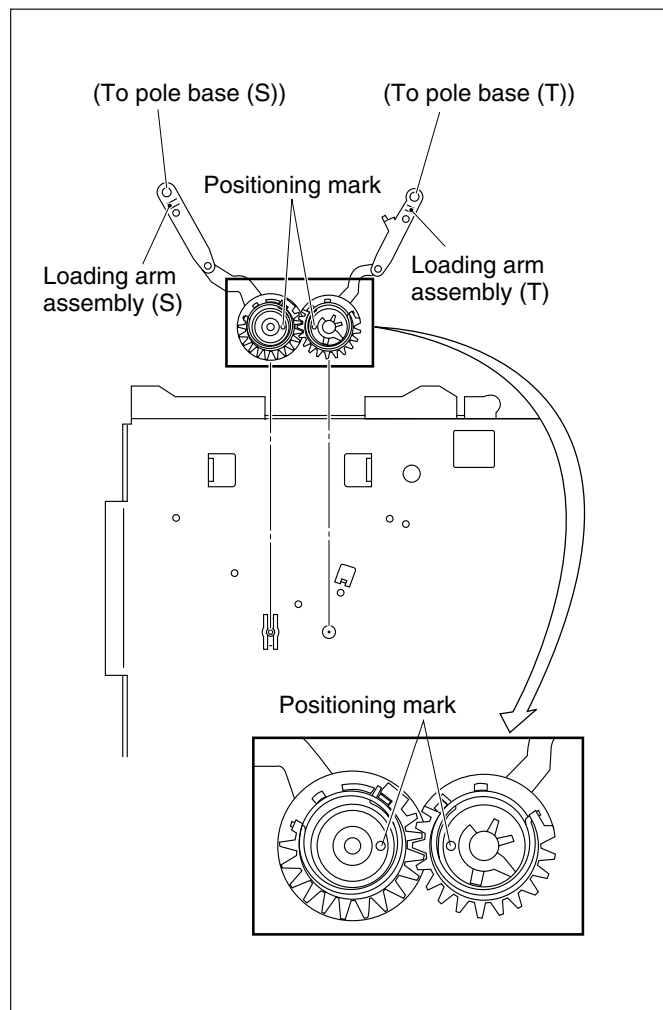


Fig. 2-4-1

2.4.3 Rotary encoder, Change lever, Control cam

- (1) When mounting the rotary encoder, apply the triangular positioning marks of the rotary encoder to those on the mounting shaft, and insert it until the catches are locked.
- (2) When mounting the change lever, set it so that the positioning holes of the change lever are matched with those on the main deck.
- (3) When mounting the control cam, while releasing the capstan brake assembly by the arrow, set it so that the positioning holes of the control cam are matched with those on the main deck.

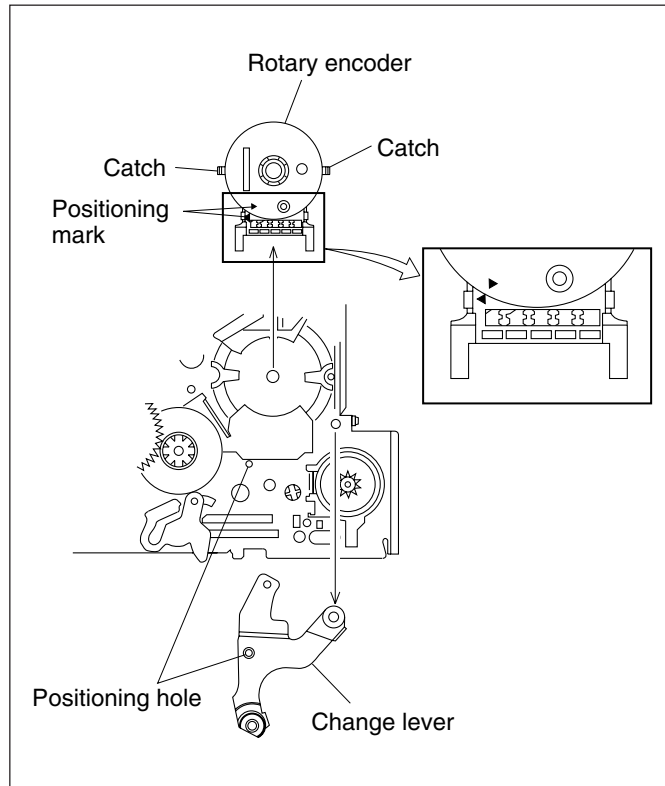


Fig. 2-4-2

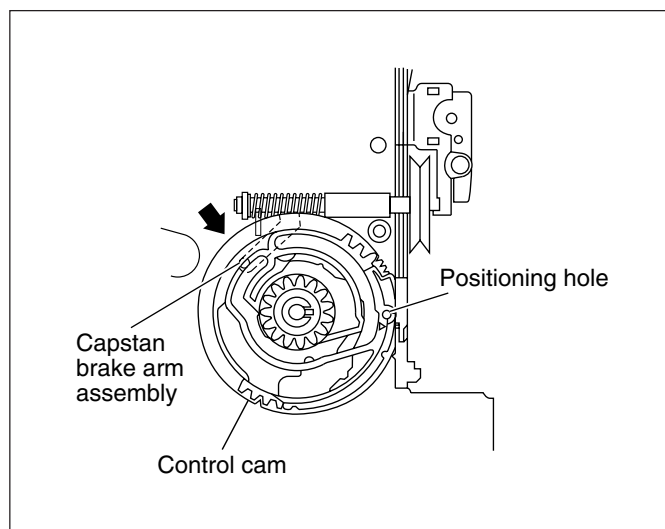


Fig. 2-4-3

2.4.4 Slide plate

- (1) Lower the main brake assemblies (S, T) until they reach to the limit and slide the change arm assembly by the arrow, mount them so that the positioning holes of the slide plate match the holes on the main deck assembly.

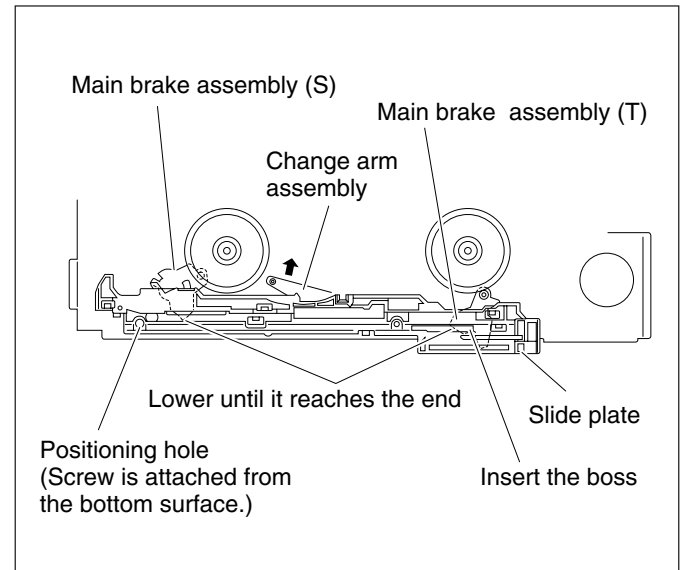


Fig. 2-4-4

2.4.5 Control plate

- (1) Mount the control plate so that the two positioning holes of the control plate match the holes on the main deck assembly and the positioning holes of the take-up lever.
- (2) After mounting the control plate, secure it with the slit washer and the control bracket.

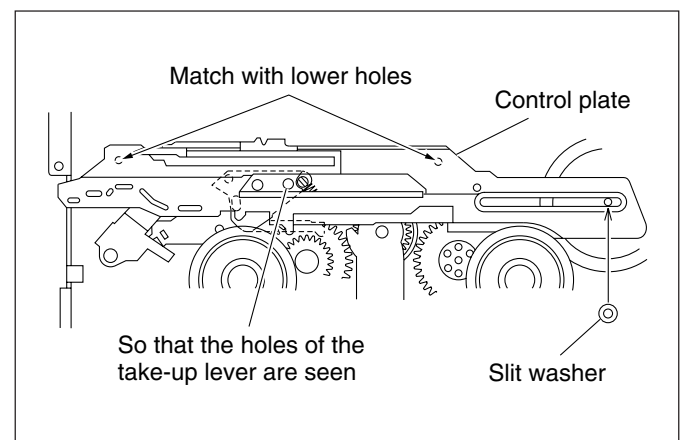


Fig. 2-4-5

2.5 INTERCHANGEABILITY ADJUSTMENT

Notes: • The Interchangeability adjustment is very important. After replacing the A/C head assembly, drum assembly or tape transport parts, the Interchangeability adjustment must be performed.

- In the Interchangeability adjustment, prepare an extra cassette tape (for recording/playback) so as not to damage the alignment tape, and perform the tape running test as a first step. (Refer to Section 2.5.6)
- Set the slope of the oscilloscope to \ominus when playing back the VFK1741 tape.

2.5.1 FM waveform linearity check/adjustment

- (1) Connect the oscilloscope to TP5 (PB FM: 8F) on the P/R board assembly and connect the external sync output to TP4 (D FF: 7F) on the P/R board assembly.
- (2) Play back the alignment tape VFK1741 to observe the FM waveform.
- (3) During playback, press the tracking buttons (+, -) simultaneously to enter the tracking center position.
- (4) By adjusting the tracking, check that there is no apparent level drop in the FM waveform and that the waveform varies totally in parallel and with linearity. If required, perform the following adjustments. (Fig. 2-5-1)
- (5) Using the hexagonal wrench (1.25 mm), lightly release the set screw at the bottom of the pole base assembly. (Pay attention not to release too much.) (Fig. 2-5-2)
- (6) During playback, press the tracking button (+, -) to reduce the FM waveform. If a drop in level is observed at the left-hand side as shown in Fig. 2-5-3, adjust the guide roller on the pole base assembly (S) using the roller driver so that a linear FM waveform is obtained. If a drop in level is observed at the right-hand side, rotate the guide roller on the pole base assembly (T) for adjustment. (Fig. 2-5-3)
- (7) After adjusting, tighten the set screw at the bottom of the pole base assembly. (Pay attention not to tighten excessively.)
- (8) After tightening the set screw, play back the alignment tape VFK1741 to check the FM waveform varies as shown in the optimum waveform changing examples.
- (9) When the alignment tape VFK1741 is played back after being ejected and reloaded or soon after the search reverse mode is operated, check that the FM waveform stabilizes within 2 sec. of appearing. If it takes more than 2 sec., check which side (right or left) of the FM waveform is unstable and check the following items.
 - A drop in level is observed at the left-hand side:
 - Check the guide roller (S) of the Pole base assembly
 - A drop in level is observed at the right-hand side:
 - Check the guide roller (T) of the Pole base assembly, the height of the guide arm assembly, and the tilt of A/C head
- (10) Perform the tape transport system check. (Refer to Section 2.5.6.)

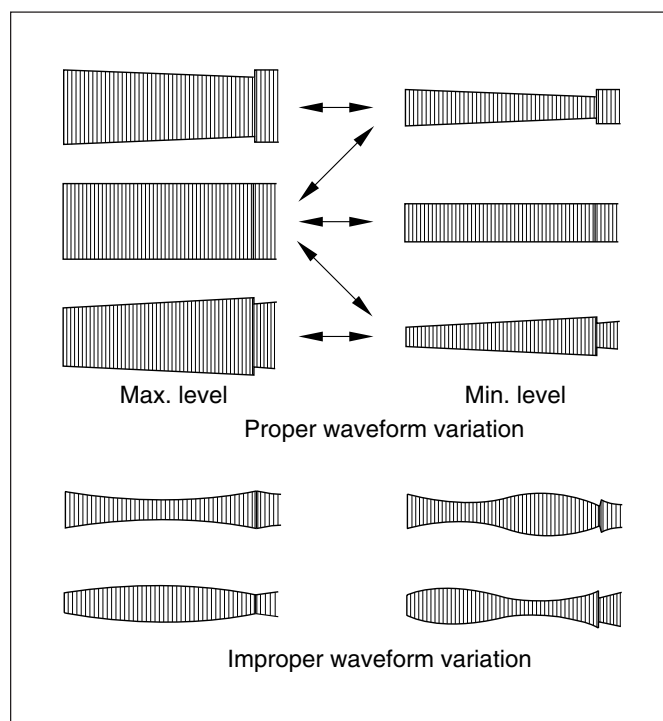


Fig. 2-5-1

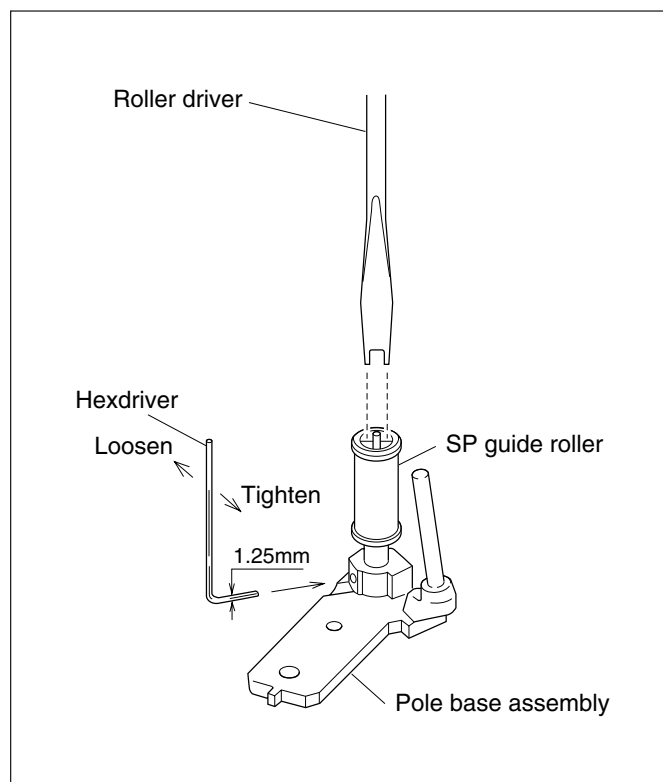


Fig. 2-5-2

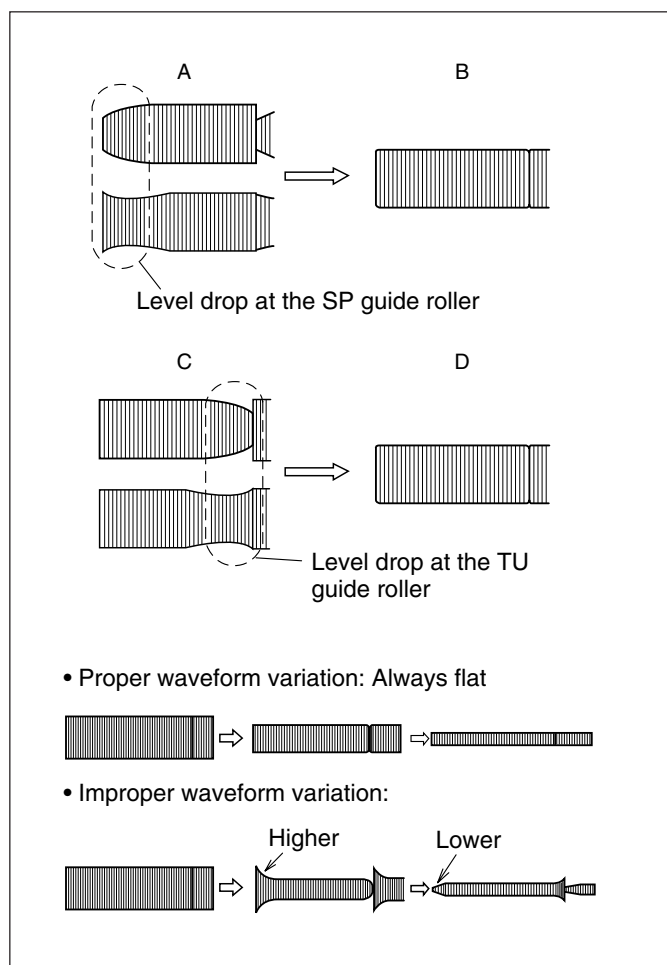


Fig. 2-5-3

2.5.2 A/C head assembly height, Azimuth check/adjustment

Note: • To make adjustment easier, set the A/C head assembly to a temporary height before hand. (Refer to Fig. 2-3-14.)

- Tilt (forward bent) adjustment
 - (1) Adjust the screw ① with the parallel check plate so that the tilt of the A/C head assembly is 0.05 mm.
 - (2) Confirm that tape is neither damaged nor wrinkled around the lower flange of the guide roller (T). If tape is wrinkled, fine adjust the height of the guide roller (T). (Refer to Section 2.5.6.)
- Height and azimuth adjustment
 - (1) Connect the CH-1 of the oscilloscope to Audio Out terminal and connect the CH-2 to TP624 (CTL: 6Q) on the main PC board, then observe the waveform at both channels with ALT mode.
 - (2) Play back the VFK1741 alignment tape, and adjust the waveform of Audio Out and control pulse are maximum values by rotating the screws ①, ② and ③ small and equal increments. <Height adjustment>
 - (3) Then rotate the screw ② to adjust so that both the audio and control pulse waveforms become maximum. <Azimuth adjustment>

- (4) Repeat the above steps No. (2) and No. (3) alternately for more precise adjustment.
- (5) Confirm that the tilt of the A/C head assembly is 0.05 mm with the parallel check plate. If it is out of specification, repeat all the steps of this section.
- (6) Perform the tape transport system check. (Refer to Section 2.5.6.)

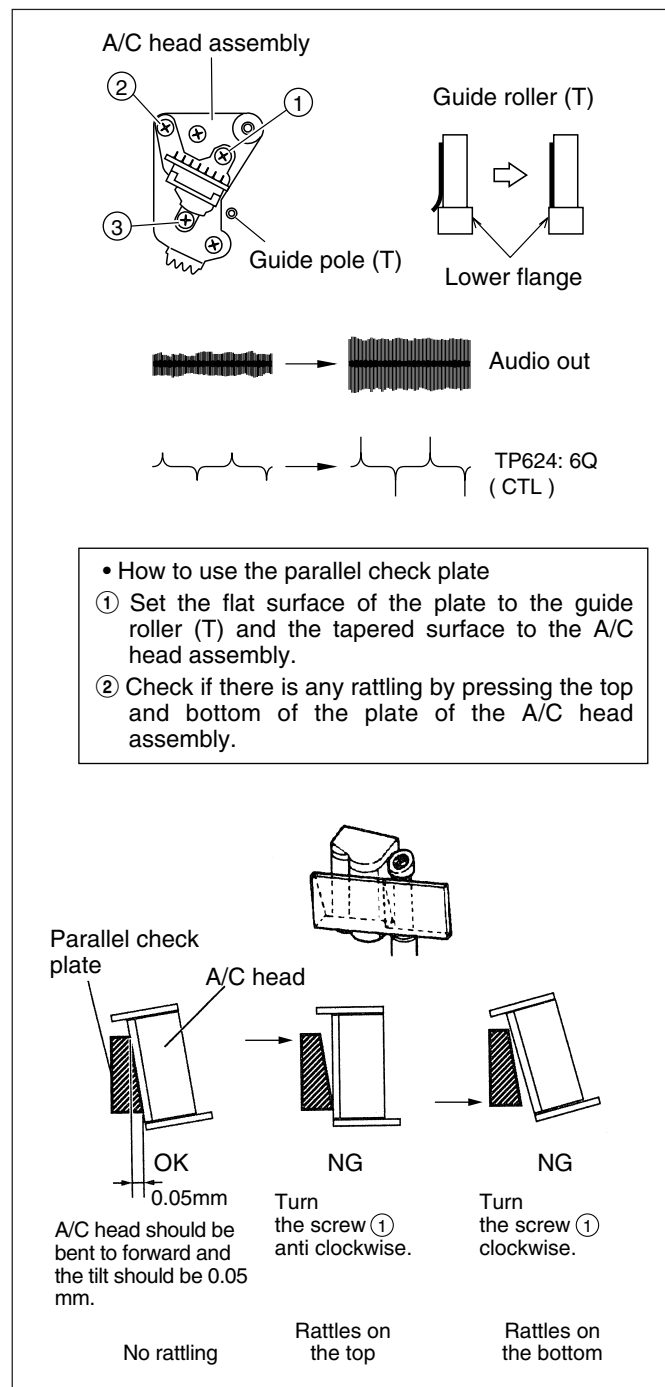


Fig. 2-5-4

2.5.3 A/C (Audio Control) head phase (X value) check/adjustment

- (1) Connect the oscilloscope to TP5 (PB FM:8F) on the P/R board and Audio Out terminal, and connect the external sync to TP4 (D FF:7F) on the P/R board.
- (2) Play back the alignment tape VFK1742 to observe the FM waveform and audio signal.
- (3) During playback, press the tracking buttons (+, -) simultaneously to enter the tracking center position.
- (4) Loosen the screws ④ and ⑤ and set the A/C head position bit as shown in Fig. 2-5-5.
- (5) Rotate the A/C head position bit to adjust the A/C head position so that the FM waveform becomes maximum and the "no-recorded" portion between the FM waveform and the audio signal is within 3 fields.
- (6) Play back the alignment tape VFK1741 and observe FM waveform.
- (7) During playback, press the tracking buttons (+, -) simultaneously to enter the tracking center position.
- (8) By adjusting the tracking, check that the FM waveform becomes maximum at the tracking center position.
(The FM level at the tracking center position should be -1 dB or more against the maximum FM level.)
- (9) If the maximum waveform is not obtained, rotate the A/C head position bit to adjust the audio control head position so that the maximum FM waveform is observed first time.

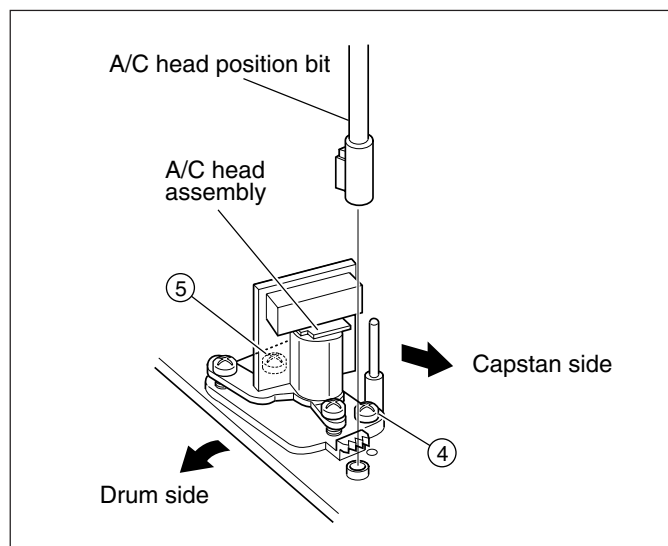
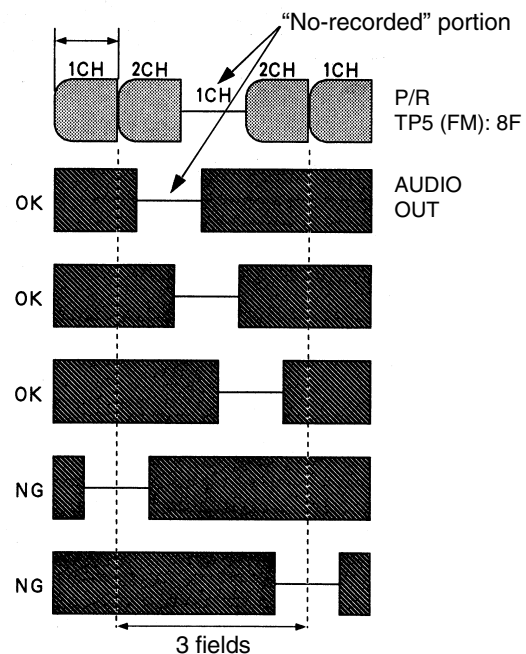


Fig. 2-5-5

- (10) Repeat the above step (6) – (9) to meet specifications of step (8).
- (11) Tighten the screws ④ and ⑤.
- (12) Confirm the azimuth of the A/C head. (Refer to Section 2.5.2.)

The FM waveform becomes maximum and the "no-recorded" portion between the FM waveform and the audio signal is within 3 fields.



• Manner of external synchronization:

- ① Set the oscilloscope's time sweep to 10 msec.
- ② In the condition that the oscilloscope is synchronized with D.F.F signal, turn the oscilloscope's HOLD OFF control in the direction of (+) to stabilize non-recorded portion.

Fig. 2-5-6

Note: How to convert dB value

When set the maximum FM level to 5.0 scale divisions on the oscilloscope,
more than -1dB: more than 4.5 scale divisions

2.5.4 Tension arm position check/adjustment

① Temporary adjustment of mounting position

- (1) Rotate the loading motor manually to set to the loading-end position.
- (2) Check that the tip of the tension arm comes to the hole "A" on the main deck.
- (3) If the tip of the tension arm does not come to the above step (2), loosen the screw ⑥ slightly and rotate the adjustment pin.

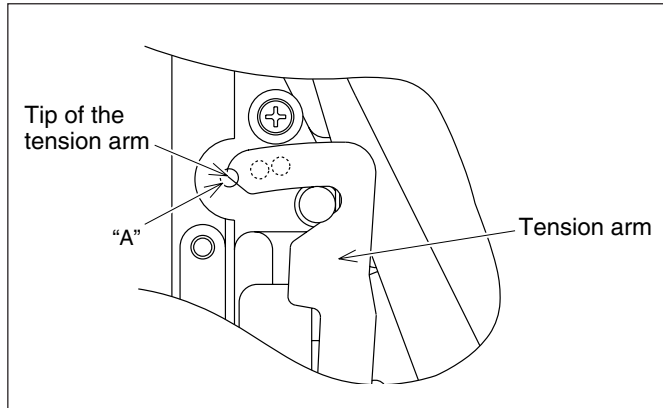


Fig. 2-5-7 (1)

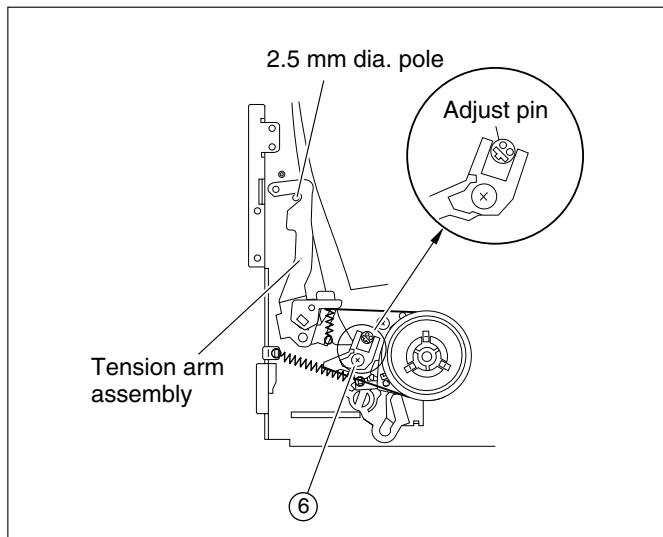


Fig. 2-5-7 (2)

② Back torque check/adjustment

- (1) Play back the cassette torque meter, and check that the torque value at the supply (left) side is $4.41 \pm 0.39 \times 10^{-3}$ N·m (indication value: 45 ± 4 gf·cm).
- (2) If the indication is not of the above value, perform adjustments in the following manner:
 - 1) Remove the cassette torque meter.
 - 2) Loosen the screw ⑥ slightly and rotate the adjustment pin.
(Turn the adjustment pin clockwise to increase the torque, and counterclockwise to decrease it.)
 - 3) Check the above step (1) again, and repeat the adjustments until the specified value is obtained.
 - 4) Perform the tape transport system check.

2.5.5 Take-up torque check

- (1) Play back the cassette torque meter, and check that the torque value at the take-up (right) side is $7.35 \pm 2.94 \times 10^{-3}$ N·m (indication value: 75 ± 30 g·cm).
- (2) If not meet the specification, replace the clutch unit (T) and confirm this section again.

2.5.6 Tape transport system check/adjustment

Note: • When the tape transport mechanism parts shown in the figure below are removed or replaced, the tape transport system check/adjustment must be performed.

① Tape transport system check

- (1) Play back the thin-type tape (E-240).
- (2) Change the playback mode in the following order:
PLAY → SEARCH REV → SEARCH FWD → PLAY
- (3) Check that creasing or damage to the tape does not occur at the SP/TU guide rollers (pole base assembly), guide rollers (S, T) or at the guide arm assembly.

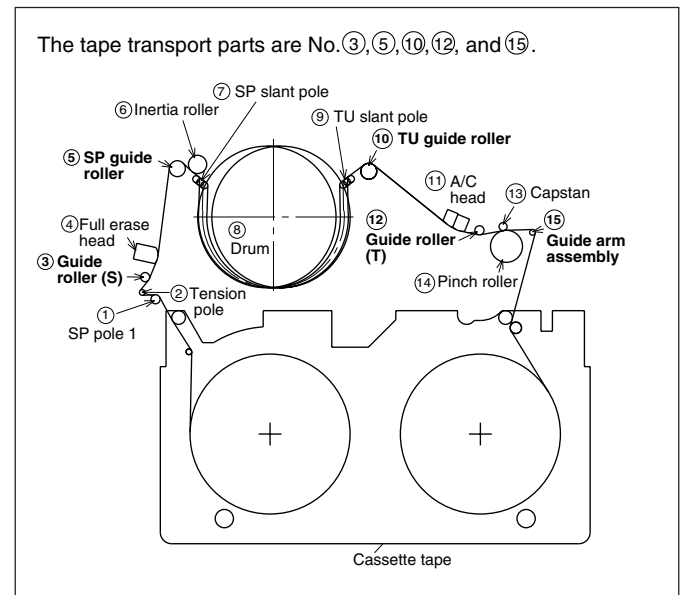


Fig. 2-5-8

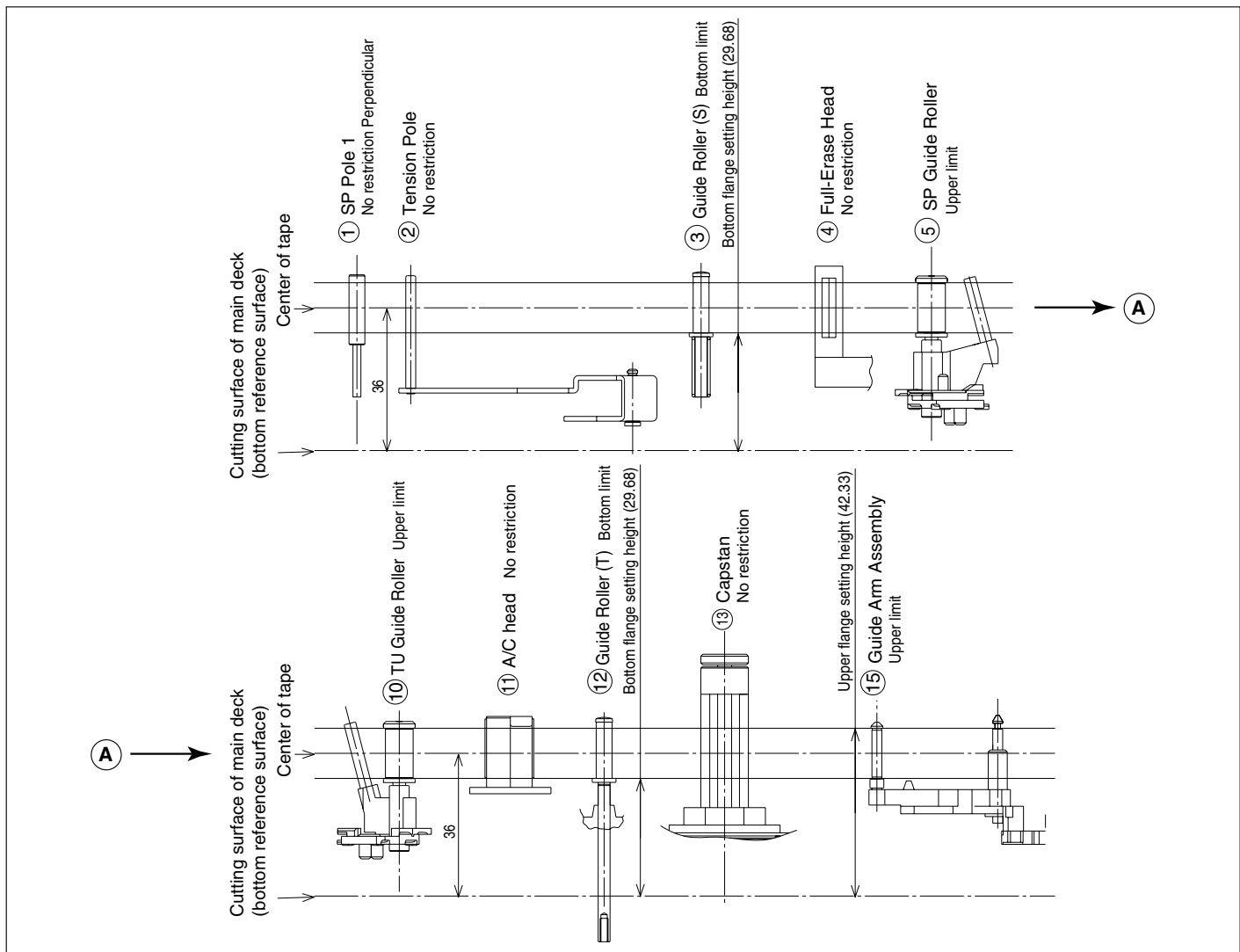


Fig. 2-5-9

② Tape transport system adjustment

(1) Guide roller (S), (T)

- (a) If creasing of the tape or other tape damage occurs at the guide roller (S) or (T), rotate the screws ⑦ and ⑧ in the tightening direction to lower the height of the guide roller (S)/(T). At this time, be sure not to rotate the screw for more than 1/2 turn.

To set the reference height of the guide rollers, tighten the screw once until it reaches the end, then rotate it by the following value in the releasing direction.

- Guide roller (S): 2.5 turns
- Guide roller (T): 1.5 turns

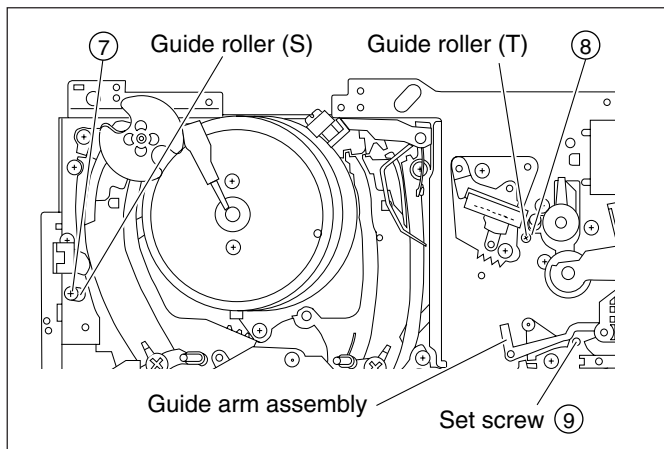
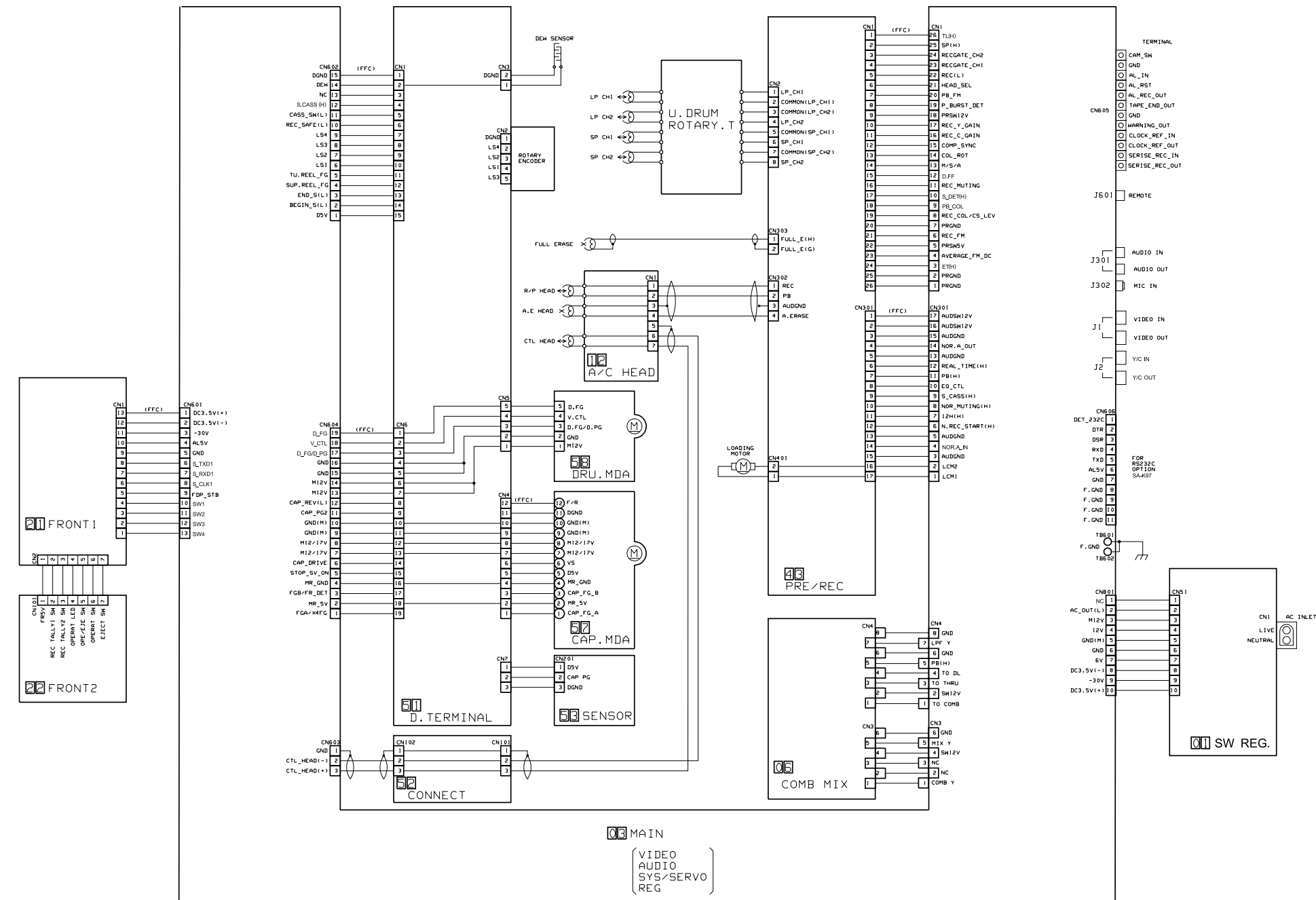


Fig. 2-5-10

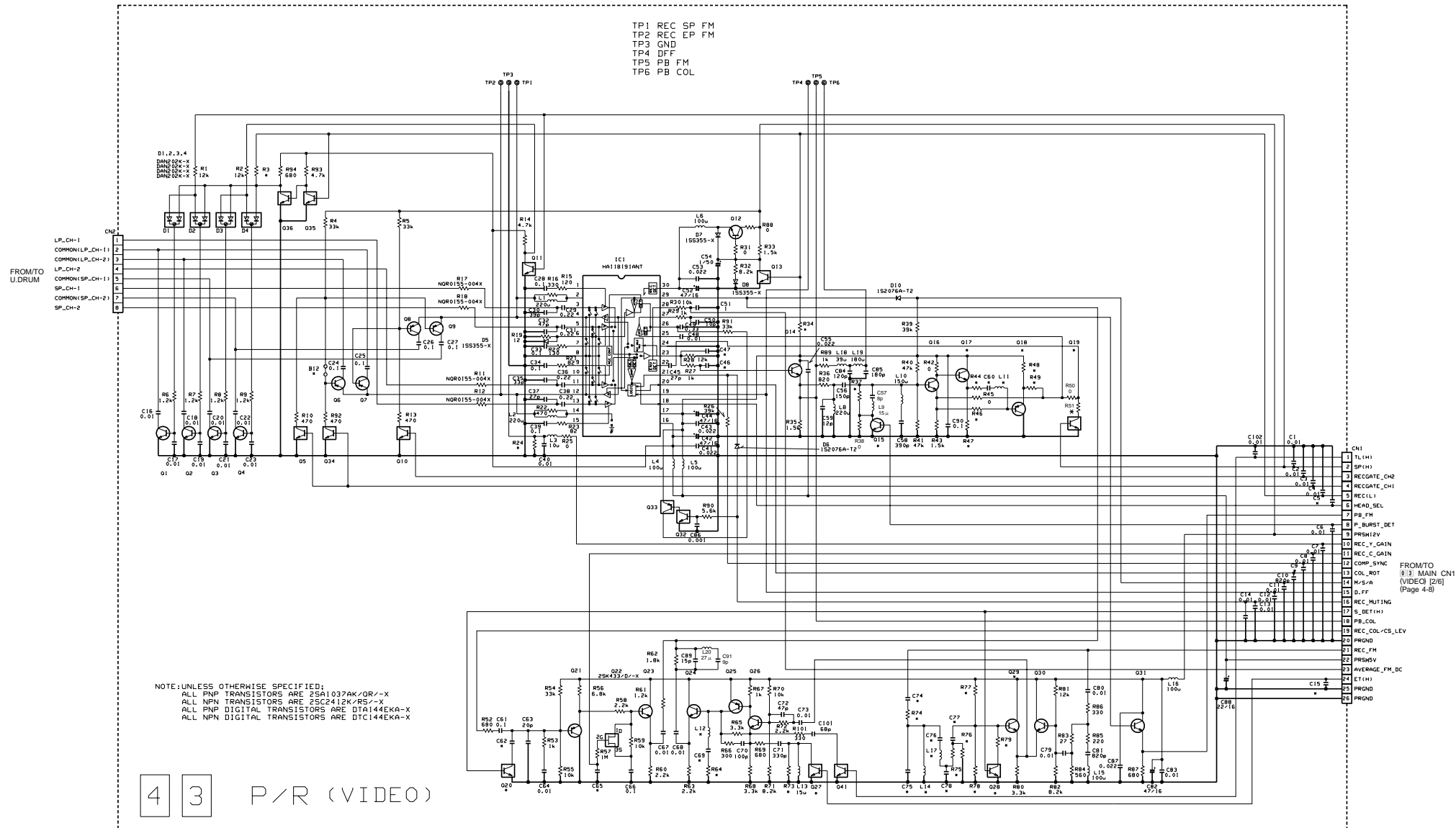
(2) Guide arm assembly

- (a) If creasing of the tape or other tape damage occurs at the flange on the guide arm assembly, adjust as follows:
- (b) Eject the tape.
- (c) Rotate the set screw ⑨ clockwise to raise the height of the guide arm assembly. (Refer to Fig. 2-5-10)
- (d) Play back the tape, and repeat this procedure until the tape creasing or tape damage does not occur. If tape is twisted between the capstan and the guide arm assembly, fine adjust the height of the guide arm assembly.
- (3) When adjusting the tape transport parts, be sure to perform the interchangeability adjustment again. (Refer to Section 2.5.1, 2.5.2 and 2.5.3.)

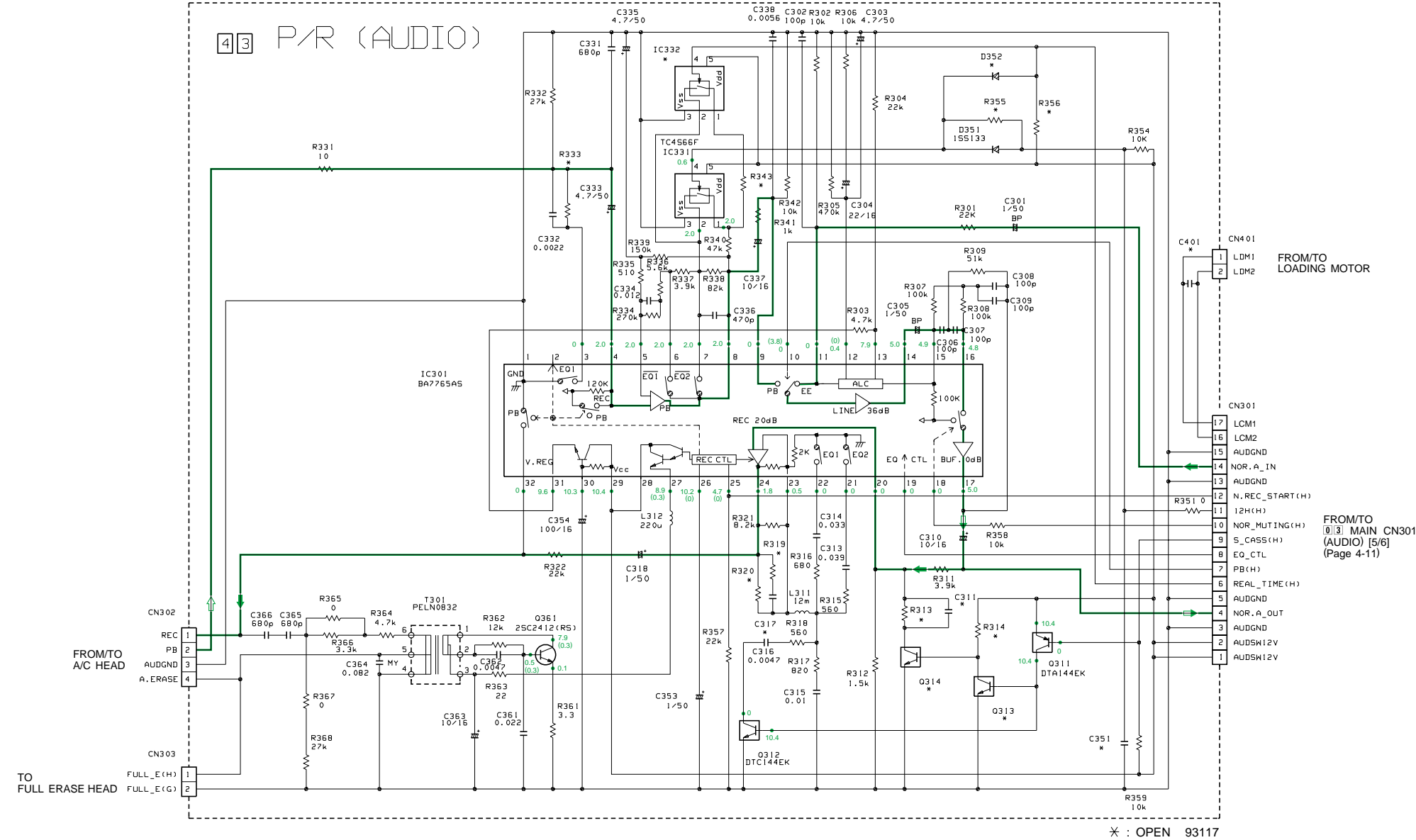
4.1 OVERALL WIRING DIAGRAMS



4.14 P/R BOARD SCHEMATIC DIAGRAMS [1/2]
4.14.1 VIDEO




4.14 P/R BOARD SCHEMATIC DIAGRAMS [2/2]
4.14.2 AUDIO




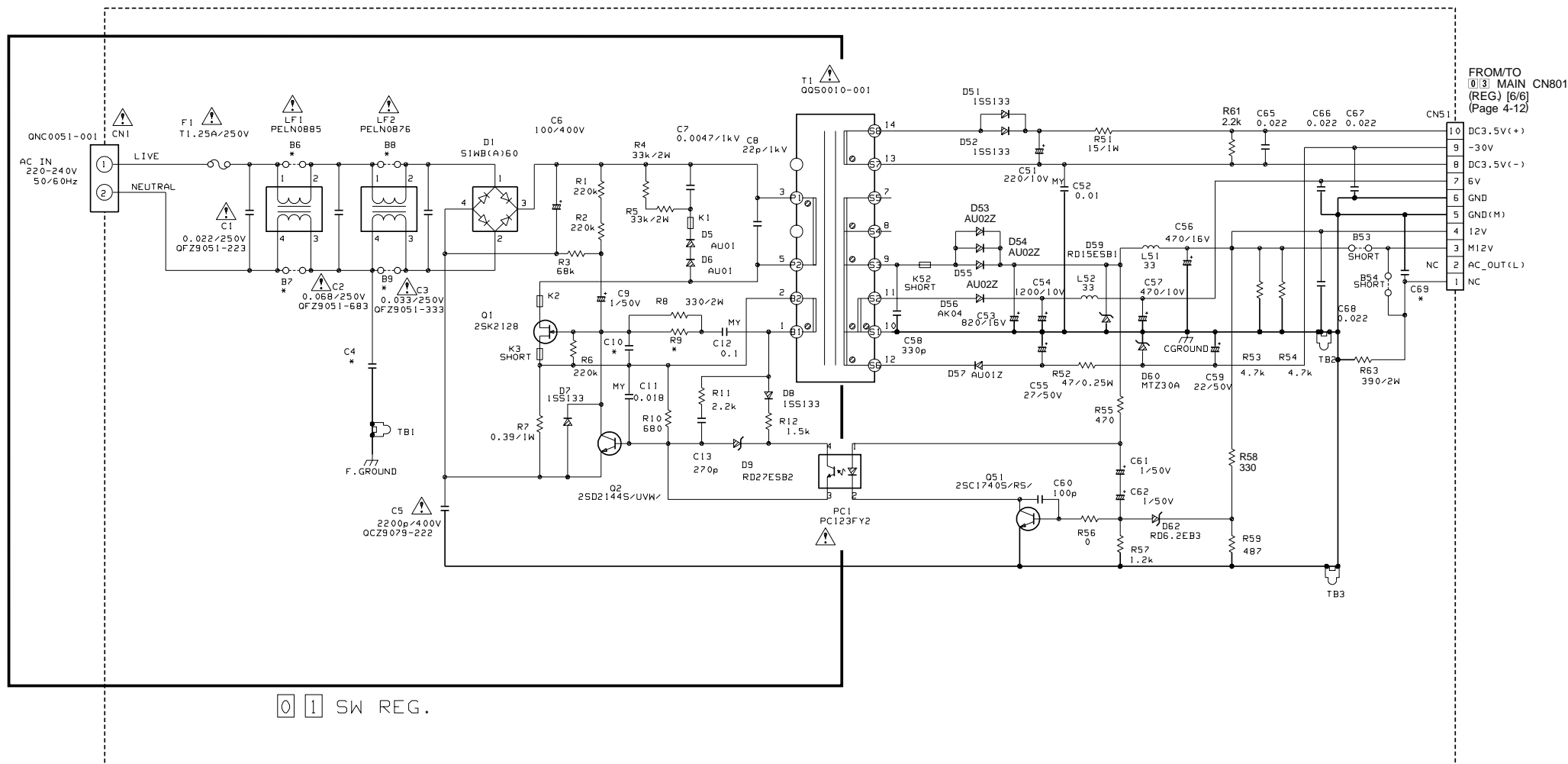
4.12 SW REG. BOARD SCHEMATIC DIAGRAM

CAUTION

THE  MARK INDICATES THE PRIMARY CIRCUIT TO DISTINGUISH THE PRIMARY FROM THE SECONDARY CIRCUIT.
PAY ATTENTION NOT TO RECEIVE AN ELECTRIC SHOCK DURING REPAIR AND SERVICE OF THE PRODUCTS.

IMPORTANT SAFETY NOTICE:

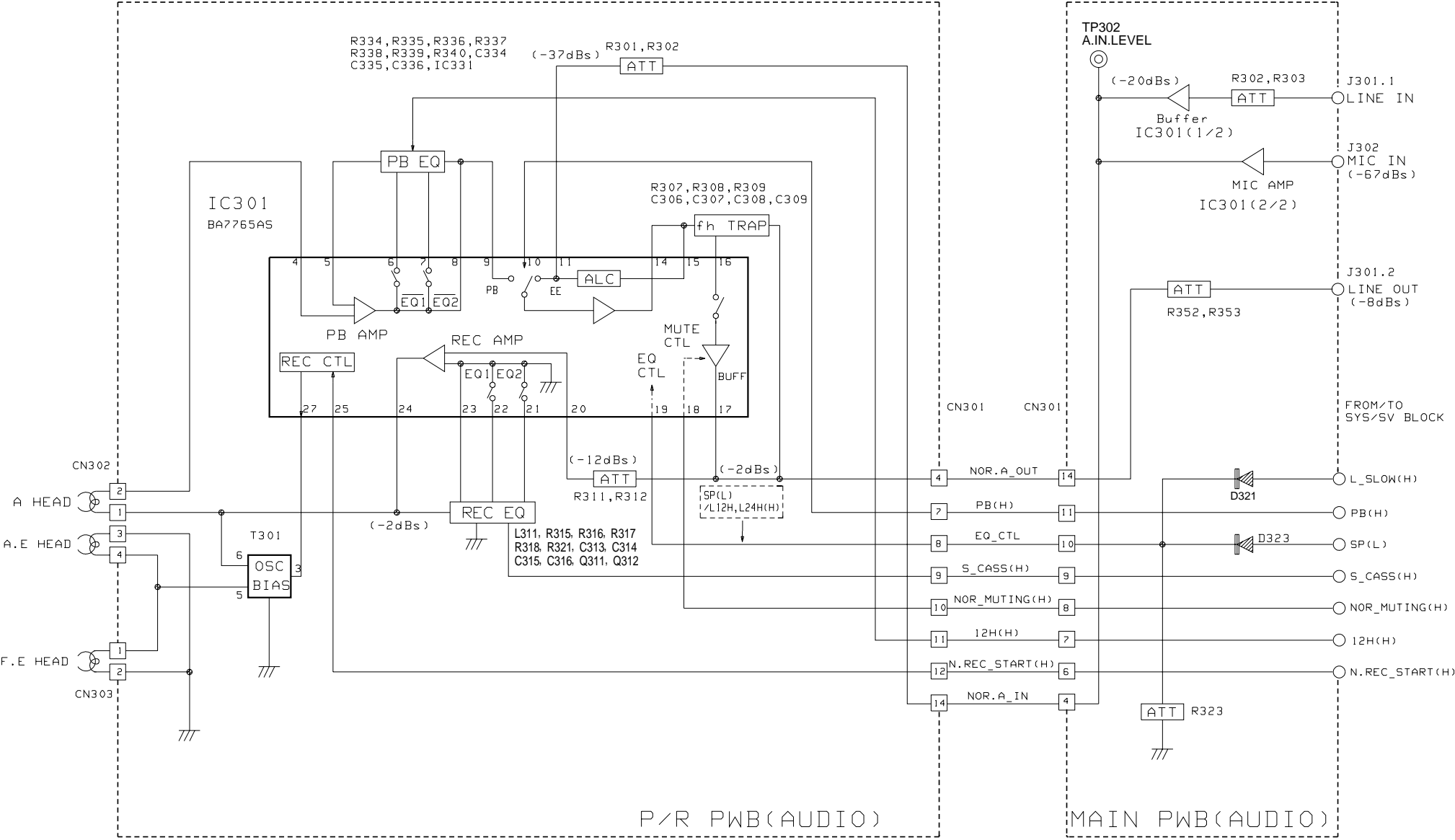
COMPONENTS IDENTIFIED WITH THE MARK  HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SAME TYPE.



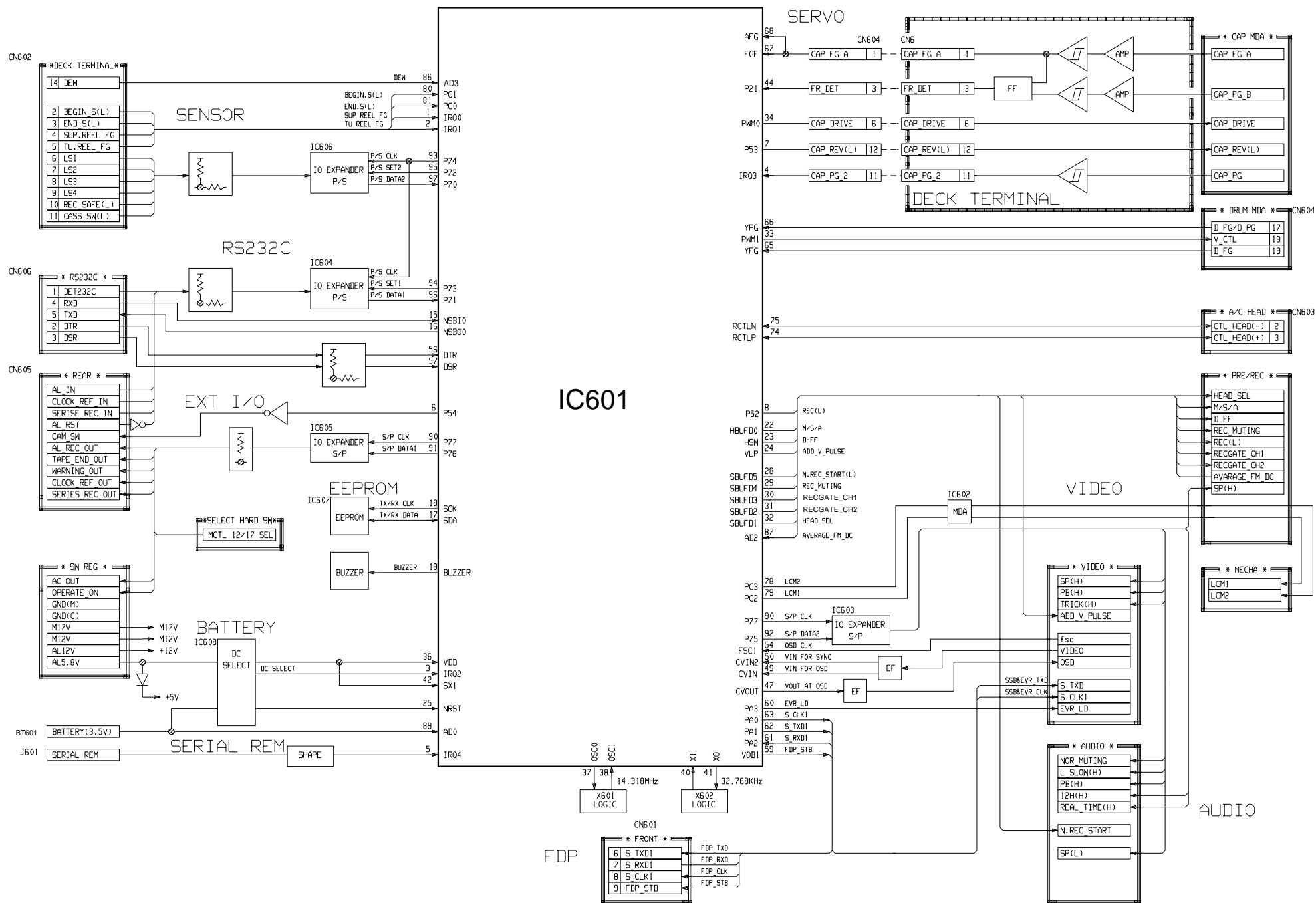
* : OPEN

93096

4.4 AUDIO BLOCK DIAGRAM

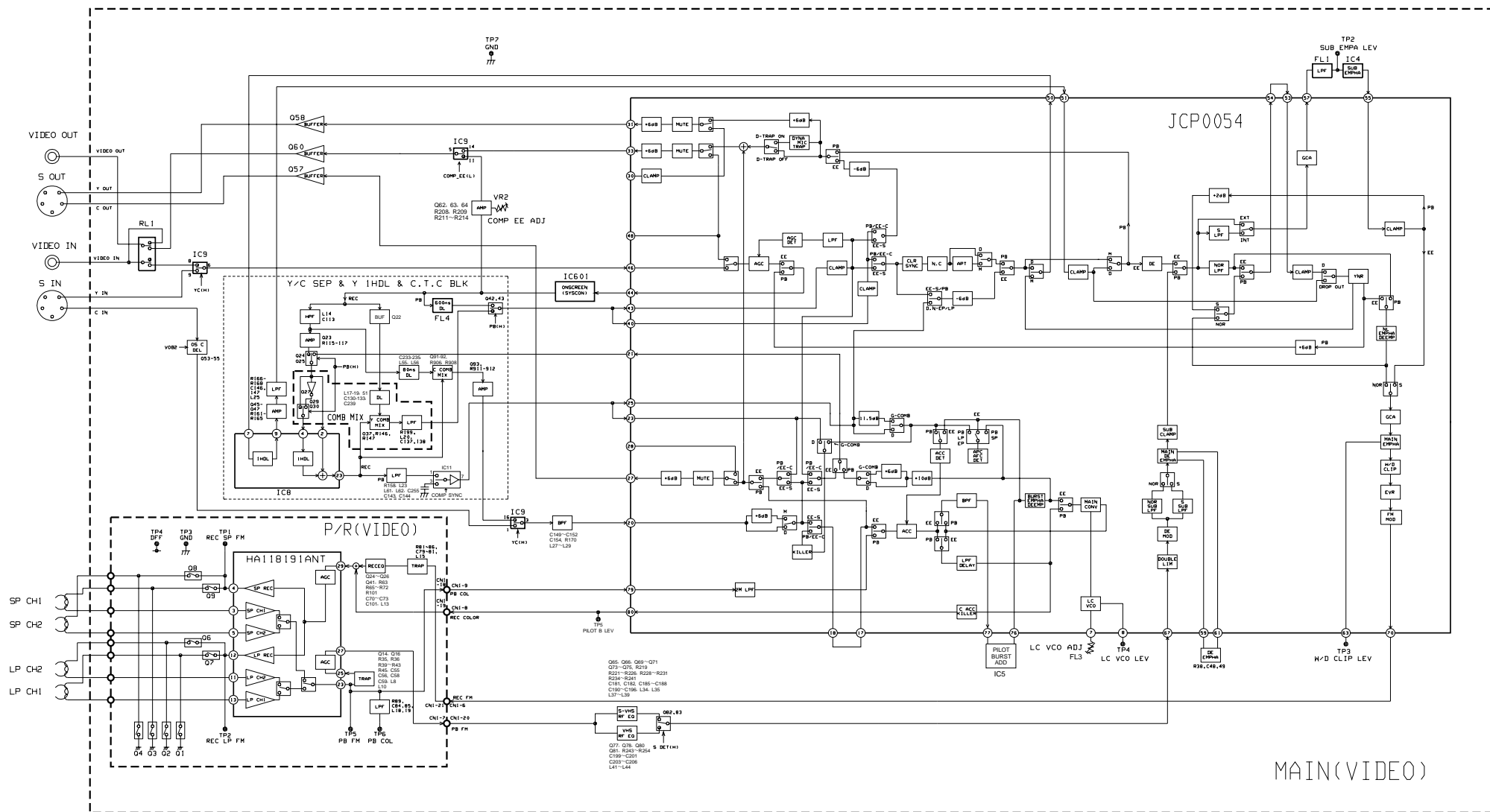


4.2 SYSCON/SERVO BLOCK DIAGRAM

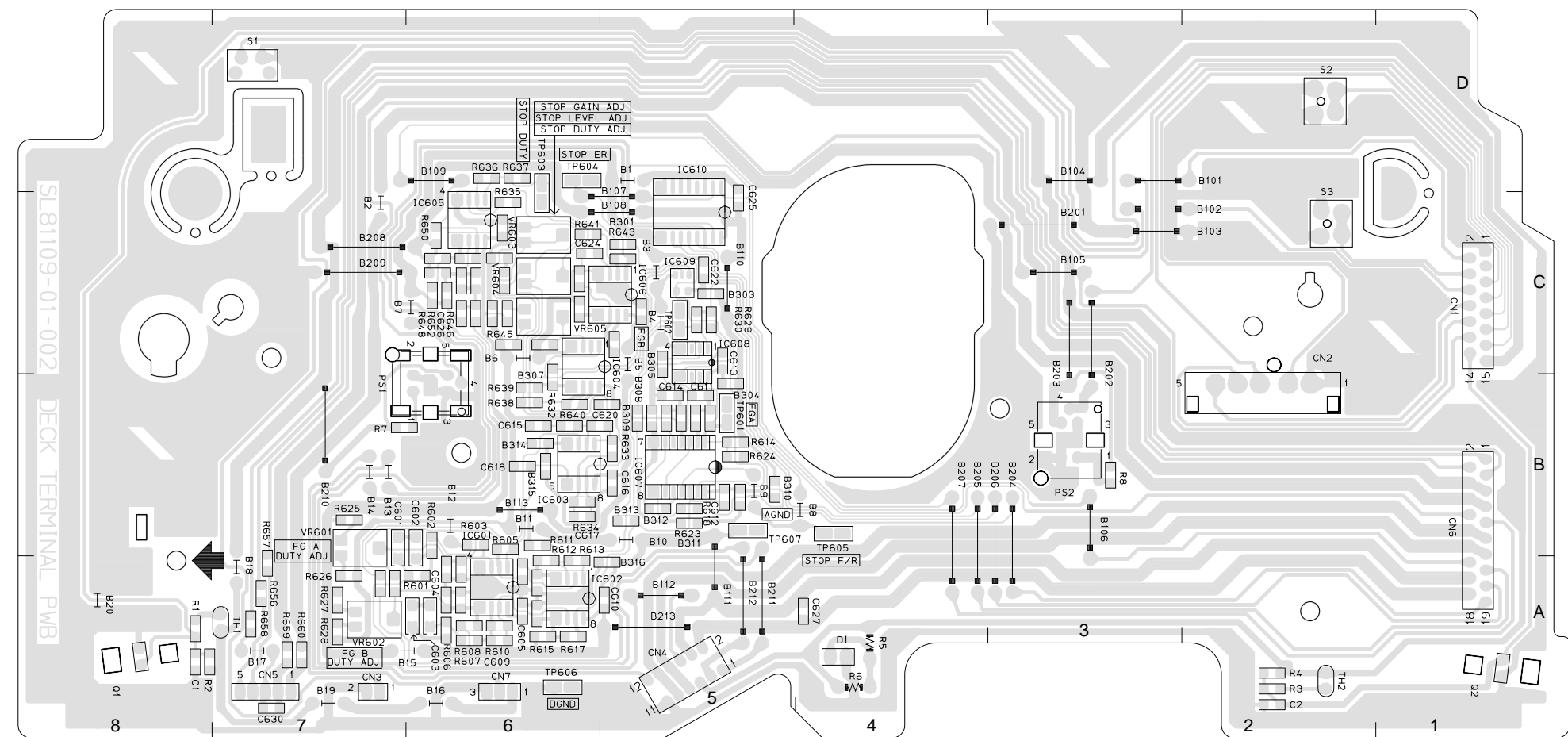


91167

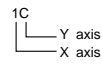
4.3 VIDEO BLOCK DIAGRAM



4.8 DECK TERMINAL CIRCUIT BOARD

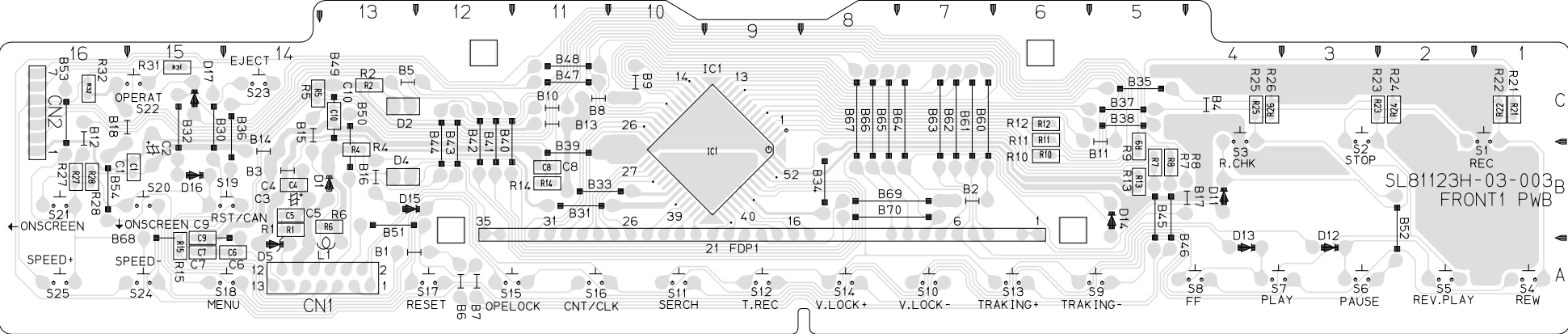


● ADDRESS LABEL OF BOARD PARTS
Each address may have an address error by one interval.

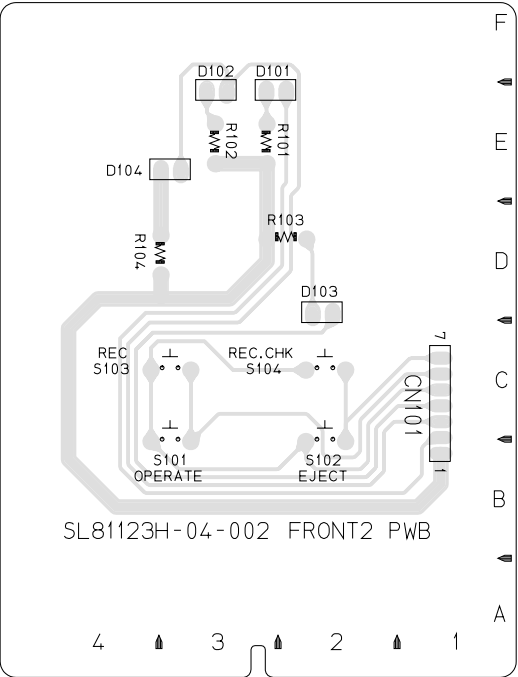


IC601 6A	R8 3B	R623 5B	R646 6C	C2 2A	C623 5C	CN4 5A	B16 6A	B206 3A	B316 5A
IC602 6A	R601 6A	R624 5B	R647 6C	C601 7B	C624 6C	CN5 7A	B17 7A	B207 4A	B317 6A
IC603 5B	R602 6B	R625 7B	R648 6C	C602 6B	C625 5C	CN6 1B	B18 7B	B208 6C	B318 7A
IC604 5C	R603 6B	R626 7A	R649 6C	C603 6A	C626 6C	CN7 6A	B19 7A	B209 6C	B319 7A
IC605 6C	R604 6A	R627 7A	R650 6C	C604 6A	C627 4A		B20 8A	B210 7B	
IC606 5C	R605 6B	R628 7A	R651 6C	C605 6A	C628 6C	PS1 6B	B101 2D	B211 5A	S1 7D
IC607 5B	R606 6A	R629 5C	R652 6C	C606 6A	C629 6C	PS2 3B	B102 2C	B212 5A	S2 2D
IC608 5C	R607 6A	R630 6A	R653 6C	C607 6A	C630 7A		B103 2C	B213 5A	S3 2C
IC609 5C	R608 6A	R631 5B	R654 6C	C608 6A		B1 5D	B104 3D	B301 5C	
IC610 5C	R609 6A	R632 6B	R655 5C	C609 6A		B2 7C	B105 3C	B302 6C	
	R610 6A	R633 5B	R656 7A	C610 5A		B3 5C	B106 3A	B303 5C	
	R611 6B	R634 6B	R657 7A	C611 5B		B4 5C	B107 5C	B304 5B	
Q1 8A	R612 6A	R635 6C	R658 7A	C612 5B		B5 5B	B108 5C	B305 5C	
Q2 1A	R613 6A	R636 6D	R659 7A	C613 5C		B6 6C	B109 6D	B306 6C	
	R614 5B	R637 6D	R660 7A	C614 5B		B7 6C	B110 5C	B307 6B	
	R615 6A	R638 6B		C615 6B		B8 4B	B111 5A	B308 5B	
R1 8A	R616 6A	R639 6B	VR601 7B	C616 5B		B9 5B	B112 5A	B309 5B	
R2 7A	R617 6A	R640 6B	VR602 7A	C617 6B		B10 5B	B113 6B	B310 5B	
R3 2A	R618 5B	R641 6C	VR603 6C	C618 6B		B11 6B	B201 3C	B311 5B	
R4 2A	R619 5B	R642 6C	VR604 6C	C619 6C		B12 6B	B202 3B	B312 5B	
R5 4A	R620 5B	R643 5C	VR605 6C	C620 5B		B13 7B	B203 3B	B313 5B	
R6 4A	R621 5B	R644 6C		C621 6C		B14 7B	B204 3A	B314 6B	
R7 7B	R622 5B	R645 6C		C622 5C		B15 6A	B205 4A	B315 6B	


4.10 FRONT1 CIRCUIT BOARD



4.11 FRONT2 CIRCUIT BOARD



--- MAIN ---

COMPONENTS IDENTIFIED WITH THE MARK  HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SAME TYPE.



